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Gas Journal

Vol. 263. 102nd Year. LONDON, SEPTEMBER 20, 1950. No. 4555. Price 1/-

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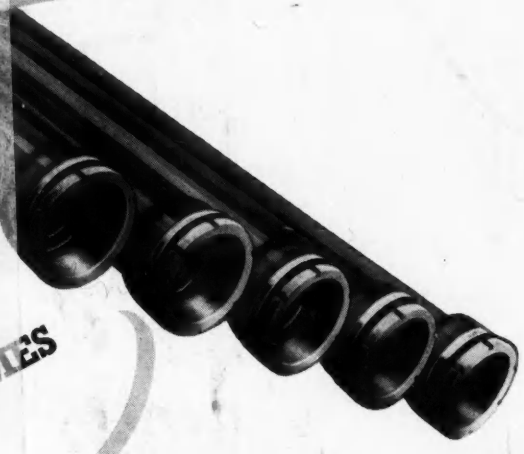
ASCOT
hot water
magnificent!
THE NEW ASCOT 503
sink gas water heater
Write for descriptive leaflet with details of new specification
GAS WATER HEATERS LIMITED · 43 PARK STREET · LONDON · W1

STANTON



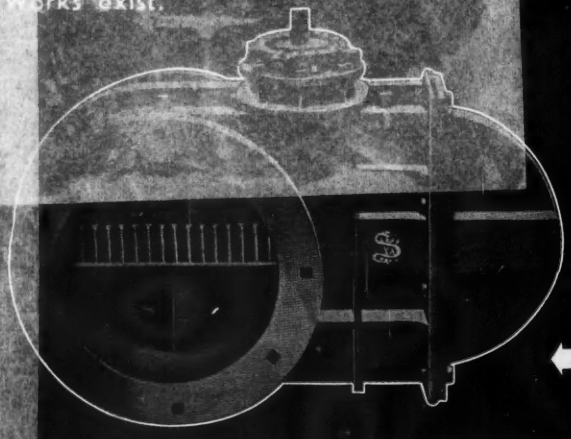
SPUN IRON PIPES
FOR ALL GAS
AND WATER SCHEMES

THE STANTON IRONWORKS
COMPANY LIMITED
NEAR NOTTINGHAM

14,000 GAS VALVES

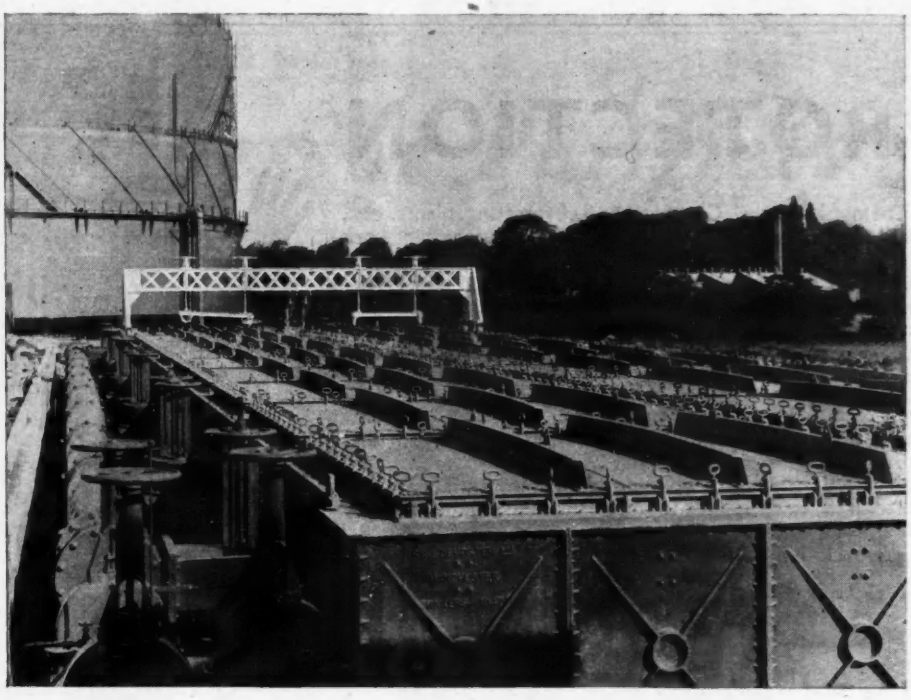
This is the number of DONKIN VALVES sold ANNUALLY. Unmistakable evidence of their popularity and reliability. They are in use in all parts of the World where Gas Works exist.

High Pressure Valve for pressures up to 100 lbs.



The Standard Donkin Rack and Pinion Low Pressure Valve which has been in general use for a great number of years.

THE BRYAN DONKIN CO. LTD.
GAS WORKS PLANT ENGINEERS · CHESTERFIELD



Purifiers

by

R. & J.

DEMPSTER

LTD.

Constructional Gas & Chemical Engineers

GAS PLANT WORKS · NEWTON HEATH

MANCHESTER · 10

London Office: 34 Victoria Street, S.W.1

Estd. 1885

We make purifiers of cast iron, steel purifiers of riveted or welded construction, purifiers at ground level or elevated upon structures, purifiers with transporters and oxide-handling plant, and tower purifiers.

e also make by-product plant, condensers, detarrers, gasholders, gas valves and connections, n castings, stills, tanks, washers, water gas plant, and welded and riveted steelwork.

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IN Chemical Works, Gas Works, Refrigerating plants, etc., the necessity for dealing with gas escapes and repair work calls for efficient protection of the men on the job. This is provided, in low concentrations of gas, by the "PURETHA" Respirator, which is comfortable, efficient and simple. Its canisters are coloured according to the gas or group of gases against which they give protection. Full mask and mouthpiece, nose-clip and goggles types.

For protection in confined spaces and high concentrations of gas, the company's well-known types of oxygen and compressed air self contained Breathing Apparatus are available. All other protective devices for the worker are also manufactured and supplied: Smoke helmets, short distance fresh air apparatus, resuscitating apparatus, dust masks, protective clothing, goggles, etc.

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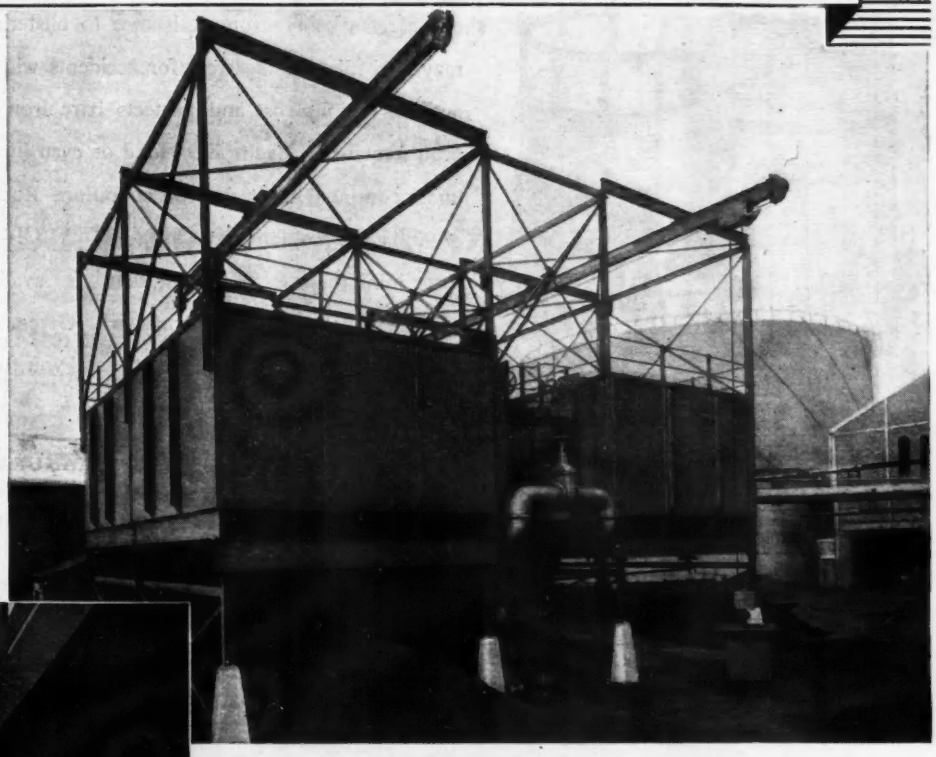
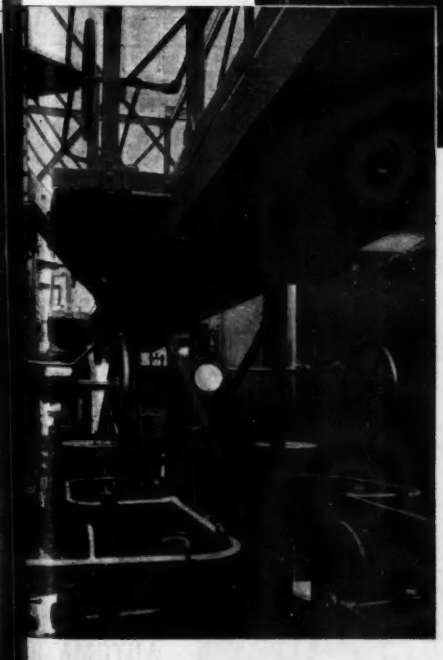
Branch works

TONBRIDGE · LEEDS · MANCHESTER

Product of Radiation Ltd.

Whessoe Purifiers





The illustrations show a 4-box set of Whessoe purifiers, each 18 ft. x 18 ft. x 10 ft., with a capacity of 1½ million cu. ft. per day, for the Ormskirk Undertaking of the N.W. Gas Board.

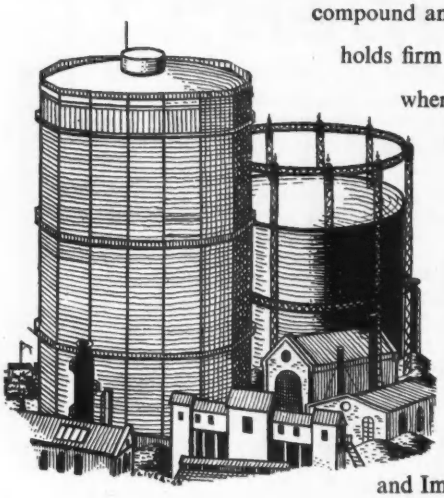
This is a simple installation with modern features—deep, welded mild-steel, overground boxes, with divided and reversible gas flow. Simple and efficient charging is provided by Morris 3-ton skips, operated by pulley-blocks, with hoisting and traversing controlled by an electrically driven winch, which is also arranged to provide for cover-lifting.

WHESSOE LIMITED DARLINGTON

LONDON - 25 VICTORIA ST. S.W.1

Telephone: Abbey 3881 Telephone: Darlington 5315

RUSTY ANSWER



Rustodian is a new answer to rust. This primer is based on a new lead compound and has been developed and tested over a number of years. Its tough film holds firm under all conditions and actively inhibits the formation of rust. Even when it is exposed to salt water or submerged under the sea Rustodian shows a remarkably strong resistance to blistering. The film, of course, may be broken or scarred, for accidents will happen, but Rustodian actively inhibits rust and protects bare iron *even after* the film has been scratched. Its life is as long or even longer than Red Lead and under continual salt water test conditions Rustodian has shown a life of 90/112 days compared with a life of 10/14 days of other standard rust inhibitors tested. Rustodian is available in Light Stone and B.S.S. colours Light Brunswick Green, Dark Battleship Grey and Imperial Brown. We shall be pleased to send you full details if you write to

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SISSON STEAM ENGINES

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DESIGNED for driving EXHAUSTERS BOOSTERS COMPRESSORS ETC.

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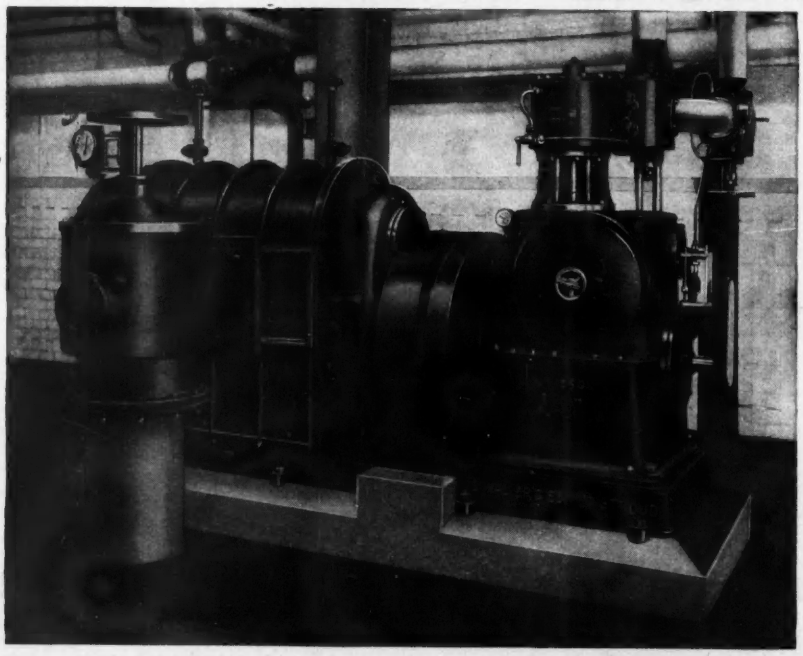

SISSON ENGINE DRIVING WALLER-ROOTS EXHAUSTER (By courtesy of Messrs. G. Waller & Son, Ltd.)

■

DEPENDABL for NON-STOP DUTY

SUITABLE for GAS GOVERNOR or AUTOMATI CONTROL

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" Deserved the title with which I acclaimed them of ' Salamander.' Both thrived in the fire . . ." Naturally we of Bell's ardently reading Mr. Winston Churchill's latest volume, The Grand Alliance, published by Cassell's, were swift to appraise the tribute-name given to Generals Freyberg and Carton de Wiart. Salamander is the symbol under which we serve as students, as graduates, as specialists in Applied Asbestos. The rigours and urgencies of war on sea and land and in the air put Asbestos to the proof as never before; it " thrived in the fire " by way of answer. And now in new and exacting demands, less dramatic but no less imperative; in the call for full and efficient productivity with husbandry of heat and power; in the solution of countless industrial problems; in developments in Australia and New Zealand and Africa, for example, the Salamander is still a very significant symbol. Engineers in quest and zest for excellence in every part of the machinery and power under their supervision constantly consult Bell's and we are proud of their confidence

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Manufacturers to whom the intenser world-marketing of their products and specialities is of moment are invited to be in touch with us. Our organisation may be able to assist

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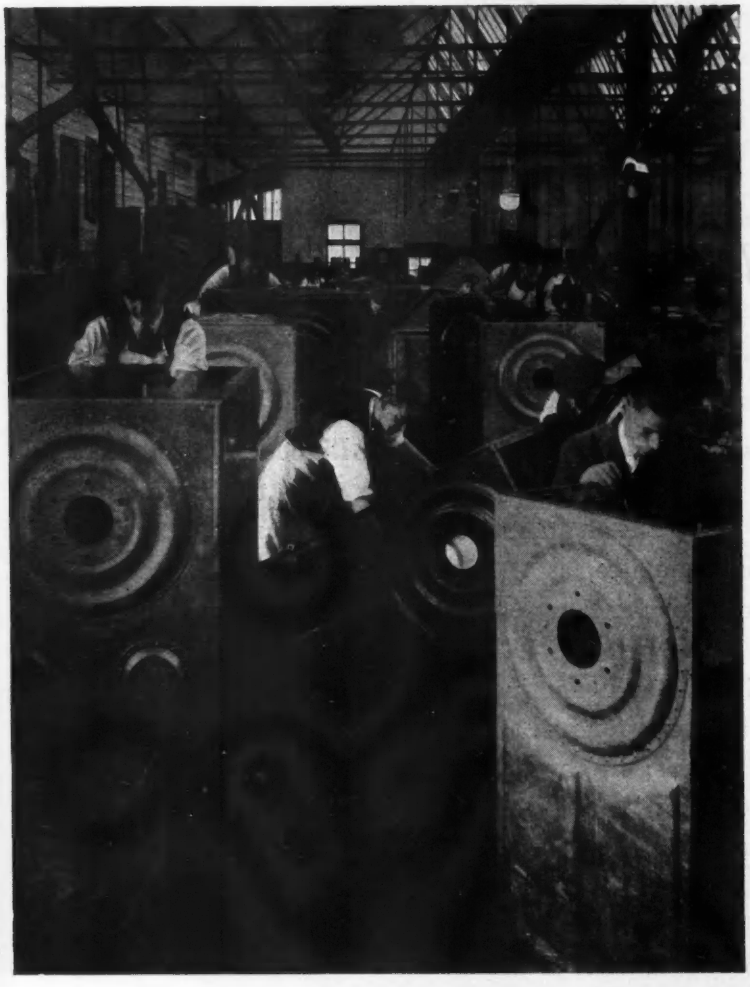

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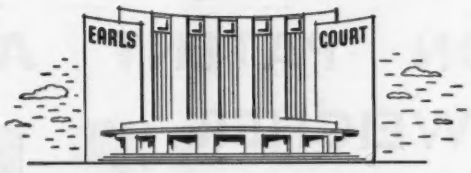
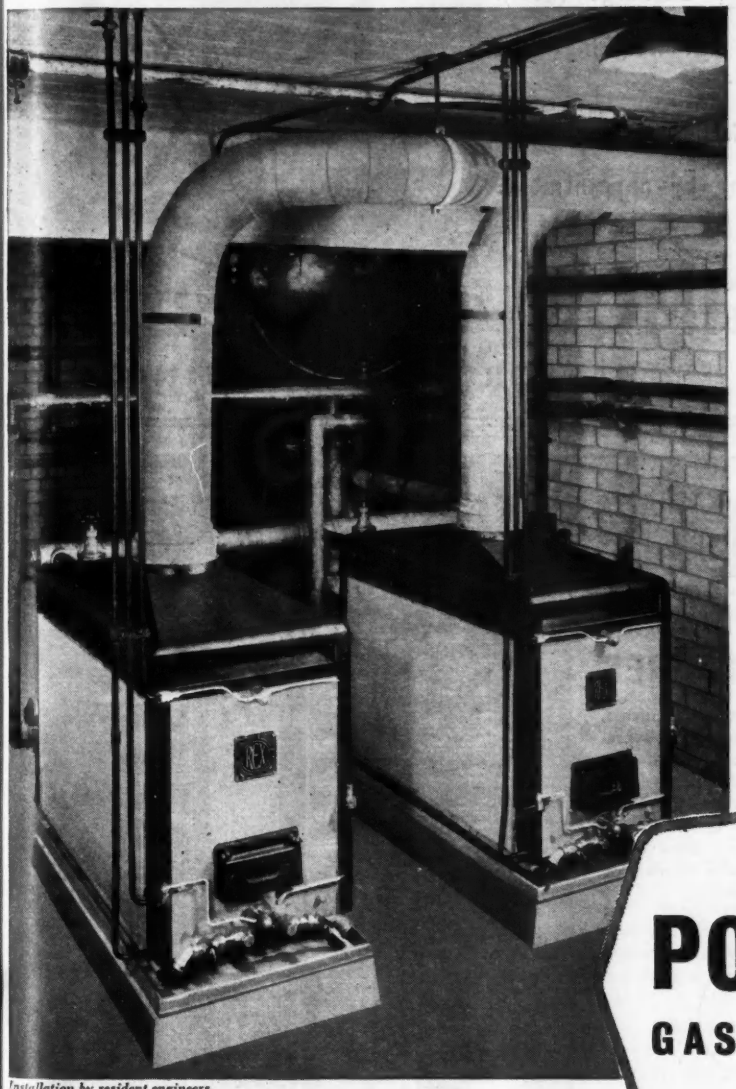


Recommendation for specification

"MADE BY DE LA RUE"



Installation by resident engineers.

For the supply of domestic hot water to the restaurants at Earls Court, POTTERTON Gas Fired Boilers have been installed. The main kitchens are served by two D Series Rex Boilers from which over 3,000 gallons of hot water may be drawn per day. Two other D Series Rex Boilers provide hot water for the Brasserie Restaurant.

Wherever there is a need for a reliable automatic hot water supply, POTTERTON Gas Fired Boilers will fill it efficiently and economically. The range includes models for domestic and commercial purposes, for hot water supply and central heating. Please write for descriptive literature.

POTTERTON
GAS FIRED BOILERS

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Northern Area: 4 Albert Square, Manchester 2. Blackfriars 3258
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THE SIMON PATENT AUTOMATIC COKE WEIGHER

Approved by the Board of Trade and stamped by the Weights and Measures Authorities.

Capacity: 28 to 112 lbs. per discharge (nett).

Speed of Weighing: Up to six weighings per minute.

Guaranteed accuracy and continuity of operation.

Machines may be seen working by appointment.

RICHARD SIMON & SONS LTD.

PHOENIX WORKS · BASFORD · NOTTINGHAM

STORAGE MADE SIMPLE

STEEL STORAGE EQUIPMENT FOR FACTORIES and STORES

Seco Steel Equipment is suitable for all storage requirements, giving maximum storage capacity in the minimum floor space. A Seco Standard Unit is available to suit your every storage need. All units can be easily assembled with a screwdriver and spanner by unskilled labour on site. We also undertake the production and installation of storage equipment to customers' own specifications. The illustrations show a few standard units from the Seco Range particularly suitable for the storing of fittings, meters, etc.

SEND FOR LIST J.

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STEEL STORAGE EQUIPMENT
THE STEEL EQUIPMENT CO., LTD.
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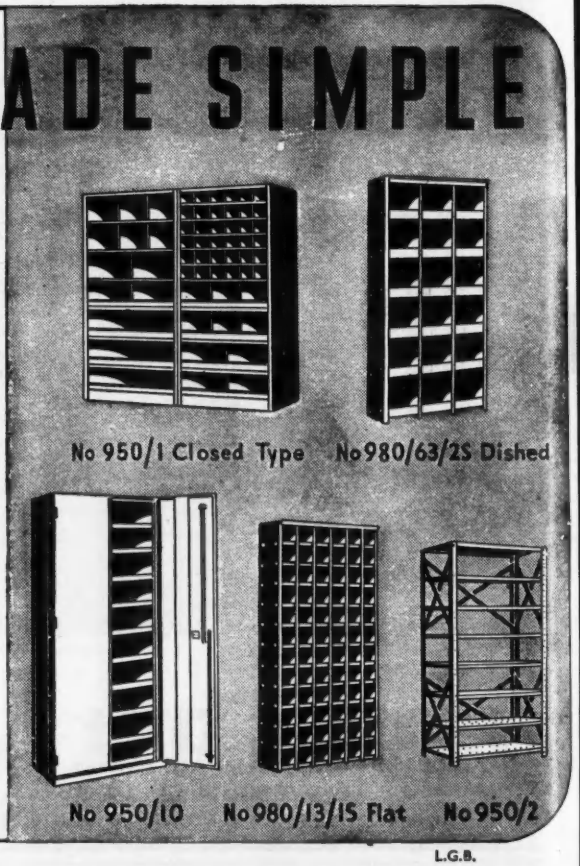


L.G.B.

Points that tell..

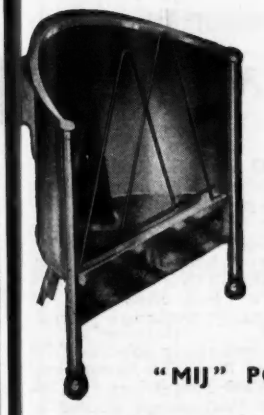
NEAT

..at the Point of Sale

CONVECTOR GAS FIRE, FA/7
This attractive background heater (above) radiates some of its heat and distributes the remainder by convection. It is fitted with four Neat burners which heat a pair of fireclay radiants. Ideal for halls or landings. Finished in cream heat resisting enamel with chromium plated top.

FA-NEAT GAS SPACE HEATERS

Neat gas burners	—	mix gas and air at the point of combustion. They cannot therefore light back yet give perfect combustion. They are silent and have single point adjustment.
Low gas consumption	—	The Neat burner principle, in conjunction with special radiants of appropriate design, gives exceptional heat output for the gas consumed.
Sturdy construction	—	made of heavy fine quality materials by the makers of the famous Ascot Gas Water Heaters, and to the same high standards.



Featuring an unbreakable chrome steel radiant, this heater provides a remarkably high degree of heat radiation for a gas consumption as low as 6½ — 7 cu. ft. per hour through three Neat burners. It is finished in heavy chromium plate and processed aluminium. The most suitable fire for small rooms or localised heating.

"MIJ" PORTABLE GAS FIRE
FA/8

This strong, handsome heater is suitable for the medium sized room. Its radiant, made of chrome steel, is unbreakable and is scientifically designed to give high radiant efficiency. The reflector is chromium plated on heavy brass and the remainder of the heater is attractively finished in cream enamel.

PORTABLE GAS FIRE
FA/3

ASCOT

FA-Neat appliances are made and distributed only by:

ASCOT GAS WATER HEATERS LIMITED,
43 PARK STREET · LONDON · W1

over 240 tons *of coal per day*

unloaded from railway trucks by *one* driver and trimmer

with the FULLY MOBILE (20 m.p.h.) 3-TON

TAYLOR JUMBO CRANE

using a Perkins P4 diesel engine running on rebateable fuel at 1/- per gallon, costs 12/6 per week for fuel. Petrol engine optional.

The new patented HYDRAULIC GRAB on the 3-ton TAYLOR JUMBO Hydraulic Mobile Crane grabs and stacks loose material; unloads 10-ton trucks in 20 minutes each with the aid of only one workman. Flat base, clean bite and positive closure ensure thorough clean up of trucks and ground. Outreach to the far side eliminates manœuvring. Grabs available in sizes from 1 to 2 cubic yards.

...or ONE ton *per min.*

from Stockpile to adjacent lorry or container by

ONE MAN

The versatile JUMBO CRANE abolishes the n for several different machines. By fitting, in a mat of seconds, our various patented attachments you h a first class machine for GRAB WORK, FOR LIFTING & STACKING, PLATFORM EL VATING for servicing overhead pipelines, wiring et POSITIONING & ERECTING TELEGRAPH LAMP STANDARDS. Full crane loads can transported quite safely over rough ground.

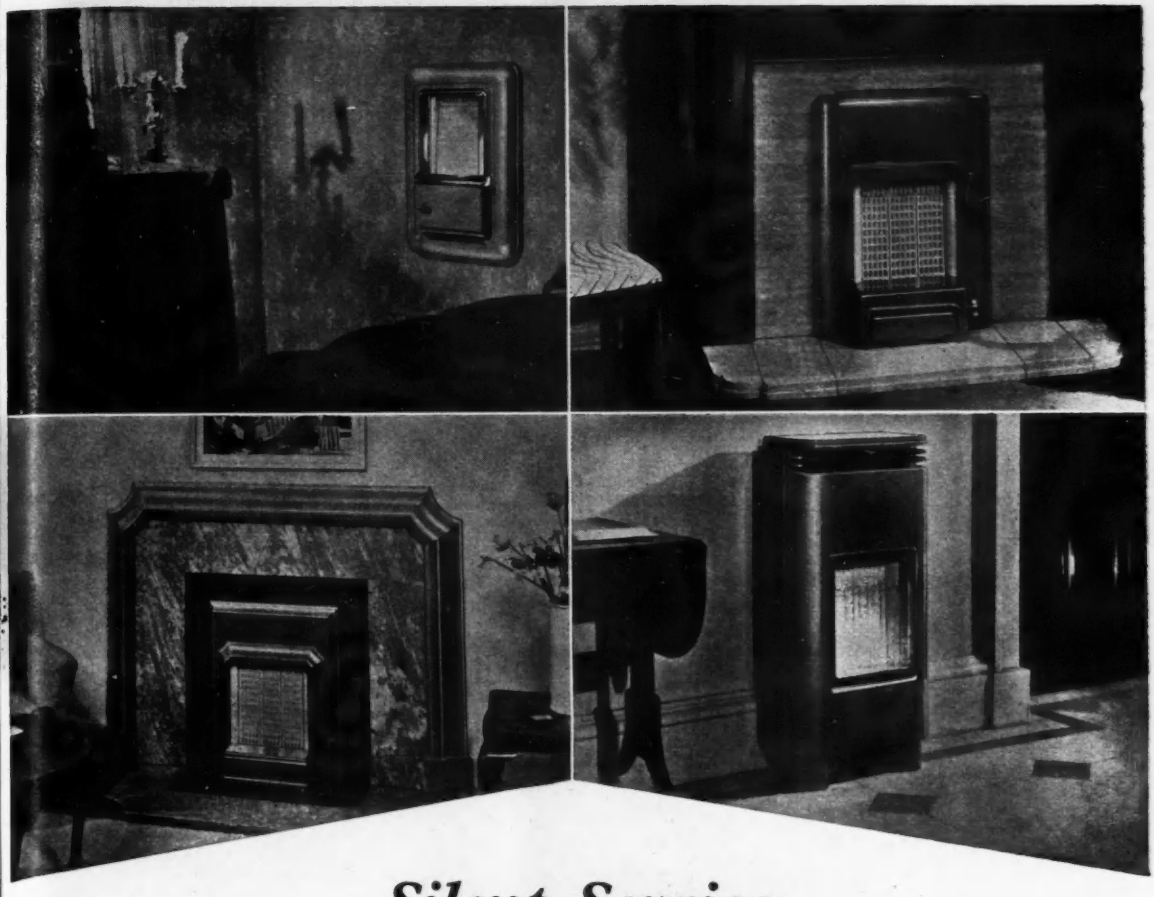
A few of many well known users of the TAYL JUMBO CRANE are:- West's Gas Improvement, Ltd., John Thompson Water Tube Boilers, Ltd., Mos and Saddleworth Gas Undertaking, Rossendale Undertaking, Bristol Gas Undertaking, I.C.I. L

We shall be pleased to demonstrate this outstandi machine at your works.

WRITE FOR BROCHURE

F. TAYLOR & SONS (MANCHESTER) LIMITE

142G, BOLTON ROAD · SALFORD [6 · LANCASHI



Silent Service

Lutello, Lancelot, Northolt, Mortimer—four fine members of Bratt Colbran's neat burner family. The 'Lutello' (the smallest) plays in the bedroom; the 'Lancelot' in the sitting-room; the 'Northolt' in the parlour (it's slightly more expensive than the 'Lancelot') and the 'Mortimer' in the hall. This family's no worry. They never even whisper, need next to no maintenance and keep the outside temperature where it belongs.

★ *THE 'LUTELLO'*
Fits in a recess without needing a separate surround.

★ *THE 'LANCELOT'*
Controlled heat by a special four-way economy tap.

★ *THE 'NORTHOLT'*
Like the 'Lancelot' but the frame is cast iron instead of pressed steel.

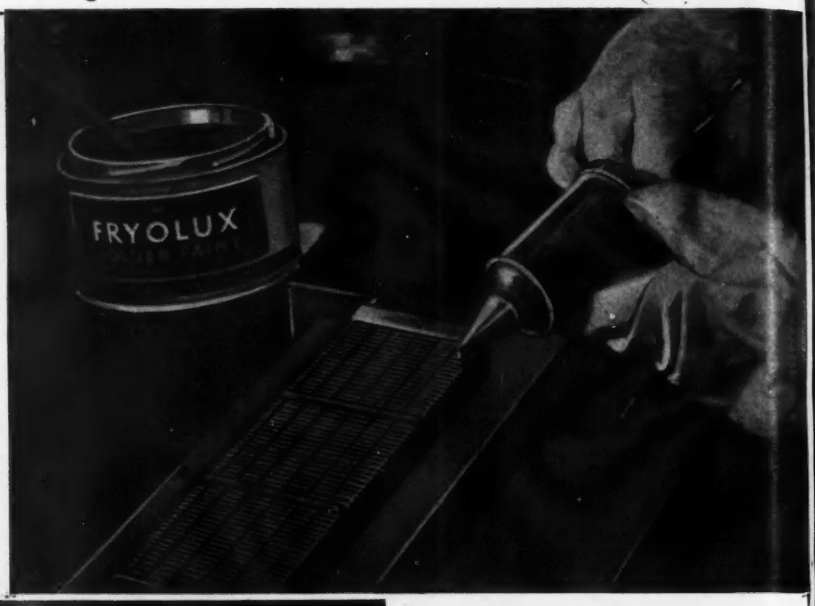
★ *THE 'MORTIMER'*
Combines convected with radiant heating.

Bratt Colbran

SPECIALISTS IN GAS HEATING

BRATT COLBRAN, LIMITED 10 MORTIMER STREET LONDON W.1. TELEPHONE: MUSEUM 9411

THEY DO IT *OUR* WAY



USING **FRYOLUX** SOLDER PAINT

FMF

The top photograph shows one operation for jointing end tubes to a radiator section. Fryolux Solder Paint is applied by pressure gun to each end, top and bottom.

The lower photograph shows another operation in which the entire section is dipped in a bath of Fryolux, diluted with water. Fryolux has many applications in industry and Fry's Technical Department is maintained in order to advise on the best methods of using all solders and fluxes supplied by Fry's.

FRY'S METAL FOUNDERS LIMITED

TANDEM WORKS · MERTON ABBEY · SW19 · MITCHAM 4023

AND AT MANCHESTER, GLASGOW, BRISTOL, BIRMINGHAM AND DUBLIN

Coke Grading & Storage plant

BATH

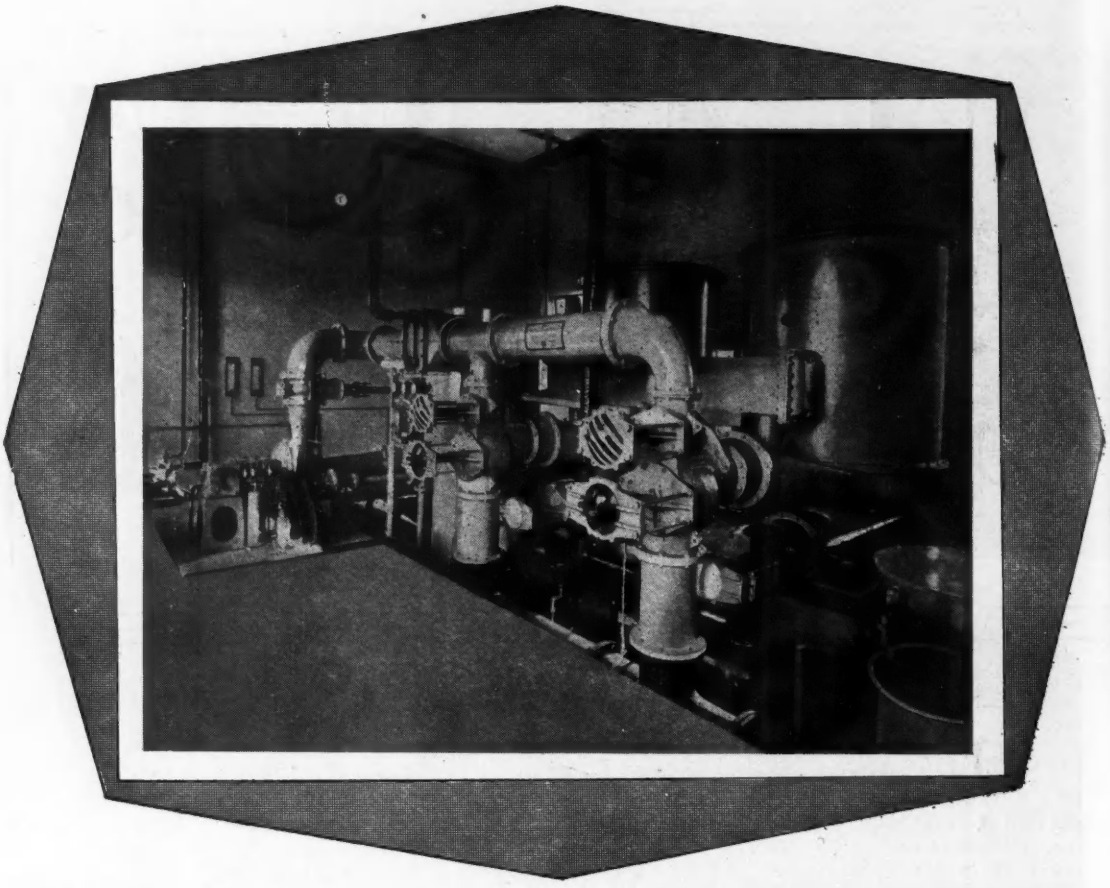
SOUTH WESTERN

GAS

BOARD

by Jenkins RETFORD of course

W. J. JENKINS & CO. LTD., RETFORD, NOTTS. Phone: Retford 131. London Office: 28 Victoria St., S.W.1. Phone: ABBey 1778



What experience means to benzole recovery in the Gas Industry!

The plant you see above is typical of many Sutcliffe Speakman plants already supplied to the Gas Industry.

They are the result of over 20 years' experience in the manufacture and use of Active Carbon for recovery purposes in every branch of industry where solvents are used. They range in size from a capacity of quarter of a million cu. ft. per day, up to 86 million cu. ft. per day, recovering millions of gallons of valuable solvent per annum, which would otherwise have gone to waste.

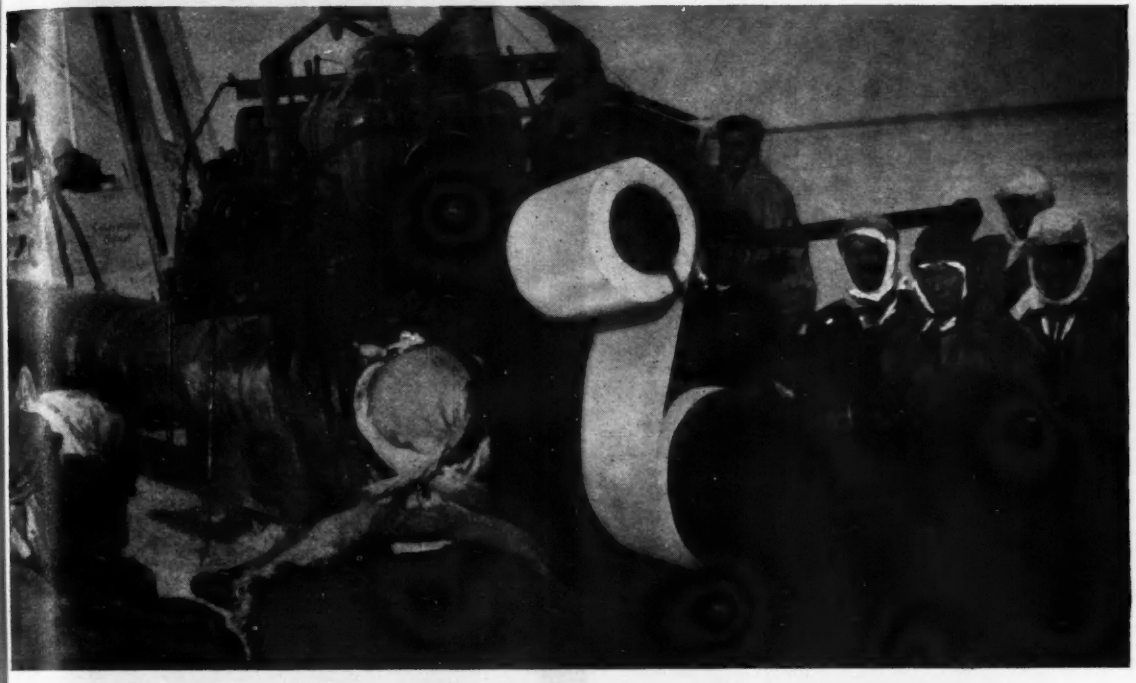
As applied to the Gas Industry, they extract the maximum amount of Benzole ; 100 per cent. recovery having been recorded. The Benzole produced is water white, giving the highest possible distillation test. There are no secondary distillation products.

The complete unit is compact and occupies a very small amount of space. It is clean in operation entirely automatic and has a minimum of moving parts. With all these advantages the cost of the plant compares very favourably with other systems. They are extremely economical in running costs and show a very handsome return on capital investment.

Our technical experts will gladly prepare a complete balance sheet based on the actual relevant data of any particular gas undertaking.

SUTCLIFFE SPEAKMAN AND COMPANY LIMITED

WORKS : LEIGH, LANCASHIRE· LONDON OFFICE : GODLIMAN HOUSE, GODLIMAN ST., E.C.4. Phone : CITY 2810



STAPLE TISSUE FOR PIPE WRAPPING

THE MATERIAL 'Fibreglass' is fine-quality glass drawn into flexible fibres of high tensile strength.
In 'Fibreglass' Staple Tissue the fibres are bonded to form a thin, pliable tissue with special advantages in pipe wrapping.

ITS ADVANTAGES Staple Tissue possesses uniform porosity which allows rapid and even penetration and complete impregnation with bitumen. It thus adds to the effectiveness of the coating, allows the bitumen to spread evenly, eliminates all air pockets and gives complete adhesion to the surface in pipe wrapping.
It is rotproof, fireproof, acid resisting; is unaffected by bacteria, fungoid growths, organic solvents and soil acids; and has the high electrical resistance which is very important in pipe wrapping.
The construction and the arrangement of the non-cellular fibres in Staple Tissue mean that no oils are wicked from the bitumen and ensure a longer life for the coating. Since 'Fibreglass' Staple Tissue cannot absorb moisture it does not swell or shrink with humidity changes, so a 'Fibreglass' wrapping means no loosening of the covering from moisture attacks.
It is easily applied and light in weight. Its lightness allows it to be supplied in longer rolls than other materials used for the same purposes and the length of the rolls saves time and labour in application as fewer stops and joins have to be made.
Its breaking strength allows winding at high speed by standard wrapping machinery at normal machine tension and it carries the normal load of bitumen impregnant without strain.
'Fibreglass' Staple Tissue is largely used as an anti-corrosive for underground pipes; small bore pipes are wrapped at the mill, and large pipes on the site.
Staple Tissue is suited to both methods of wrapping—and takes bitumen at a temperature of 450°F without turning a glass hair!

STAPLE TISSUE WRAPS THE PIPELINE Some 15,000,000 square feet of 'Fibreglass' Staple Tissue have already been used for oil pipelines in the Middle East. The above photograph shows a length of oil pipe in process of being wrapped.

COMPETITIVE IN PRICE WITH
TRADITIONAL MATERIALS AND AVAILABLE
IN QUANTITY NOW.

FIBREGLASS
TRADE MARK

FIBREGLASS LIMITED, RAVENHEAD, ST. HELENS, LANCS,
ST. HELENS 4224

NEWCASTLE-ON-TYNE OFFICE:
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136 Renfield Street. (Douglas 2687)

LONDON OFFICE:
63/65, Piccadilly, W.1. (Regent 2115/6)

PGC

SPECIALISTS IN DESIGN AND CONSTRUCTION OF PLANTS FOR THE PRODUCTION, COOLING CLEANING AND PURIFICATION OF INDUSTRIAL GASES

GAS MAKING PLANTS

FOR DILUTION PURPOSES:
PRODUCER GAS

FOR RETORT & OVEN HEATING
BLUE WATER GAS

CARBURETTED WATER GAS
FOR PRIMARY SUPPLY & PEAK LOAD:

CATALYTIC PROCESSES OF GASES

HYDROGEN
(By Steam-Iron or Catalytic Processes)

FOR OTHER APPLICATIONS:
CARBON MONOXIDE
CARBON DIOXIDE

THE POWER-GAS CORPORATION LIMITED
STOCKTON-ON-TEES

ABP

SPECIALISTS IN DESIGN AND CONSTRUCTION OF PLANTS FOR THE GAS INDUSTRY

GAS WORKS PLANT

- GASHOLDERS
  STANDARD & SPIRAL GUIDED—DRY TYPE
- WASHERS
- PURIFIERS
  ELECTRICALLY WELDED
- CONDENSERS
  HORIZONTAL & VERTICAL
- "MEEHANITE" IRON CASTINGS

Reconstructions Renewals and Repairs

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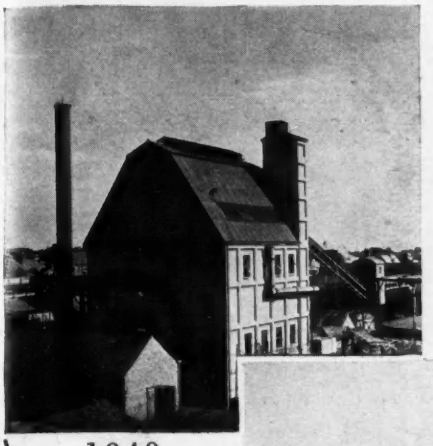

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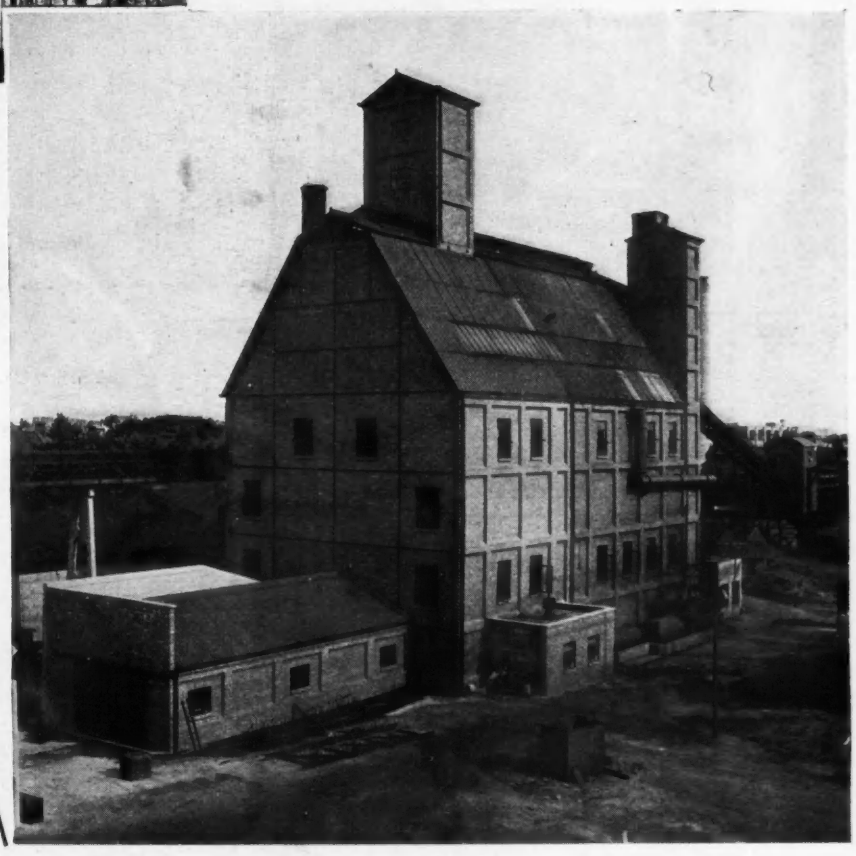


C.O.L. I.V.C. Plant, Bridlington Undertaking, N.E.G.B. 1950

Many C.O.L. INTERMITTENT VERTICAL CHAMBER PLANTS have been designed to allow for future expansion and that illustrated above shows the recent extension just completed. The original plant at Bridlington was of 12 chambers, and now consists of 18 chambers with a total output of 1.8 million cu. ft. per day

C.O.L. INTERMITTENT VERTICAL CHAMBERS

BY

GAS CHAMBERS & COKE OVENS LTD.

CHANDOS HOUSE, BUCKINGHAM GATE, LONDON, S.W.1. *Abbey* 6912.

The modern outlook

Vulcan 94P

gas cookers

Among the many outstanding features of the Vulcan 94 Type "P" is the famous ARMOURPLATE Door —a patent, glass door, fully guaranteed against breakage—always stays clear.

Type "P" is a free-standing, totally enclosed, plinth-mounted cooker—vitreous enamel throughout.

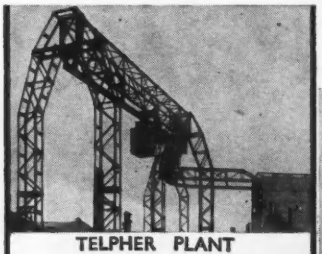
Alternative fittings include a variety of finishing colours, enamelled door, closing coverplate, hot plate and different oven capacities.

Vulcan

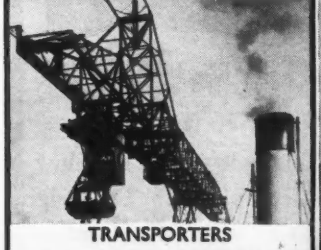
THE VULCAN STOVE CO·LTD
EXETER

Telephone: 5301-2 Exeter Telegrams: "Vulcan, Exeter"

Every Vulcan ARMOURPLATE Glass Door carries an unconditional guarantee against breakage.



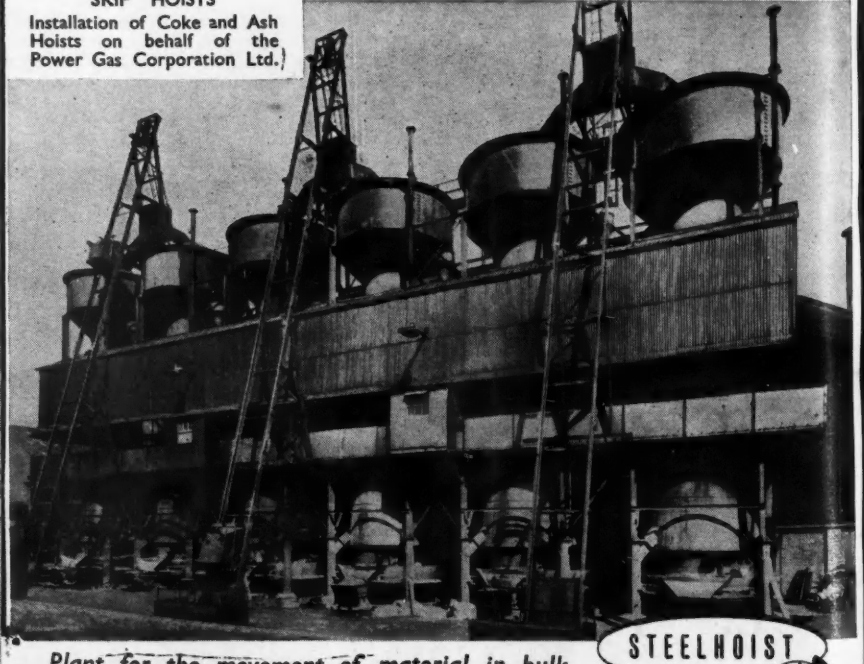
TELPHER PLANT



TRANSPORTERS

WAGON TIPPLERS

SKIP HOISTS
Installation of Coke and Ash Hoists on behalf of the Power Gas Corporation Ltd.



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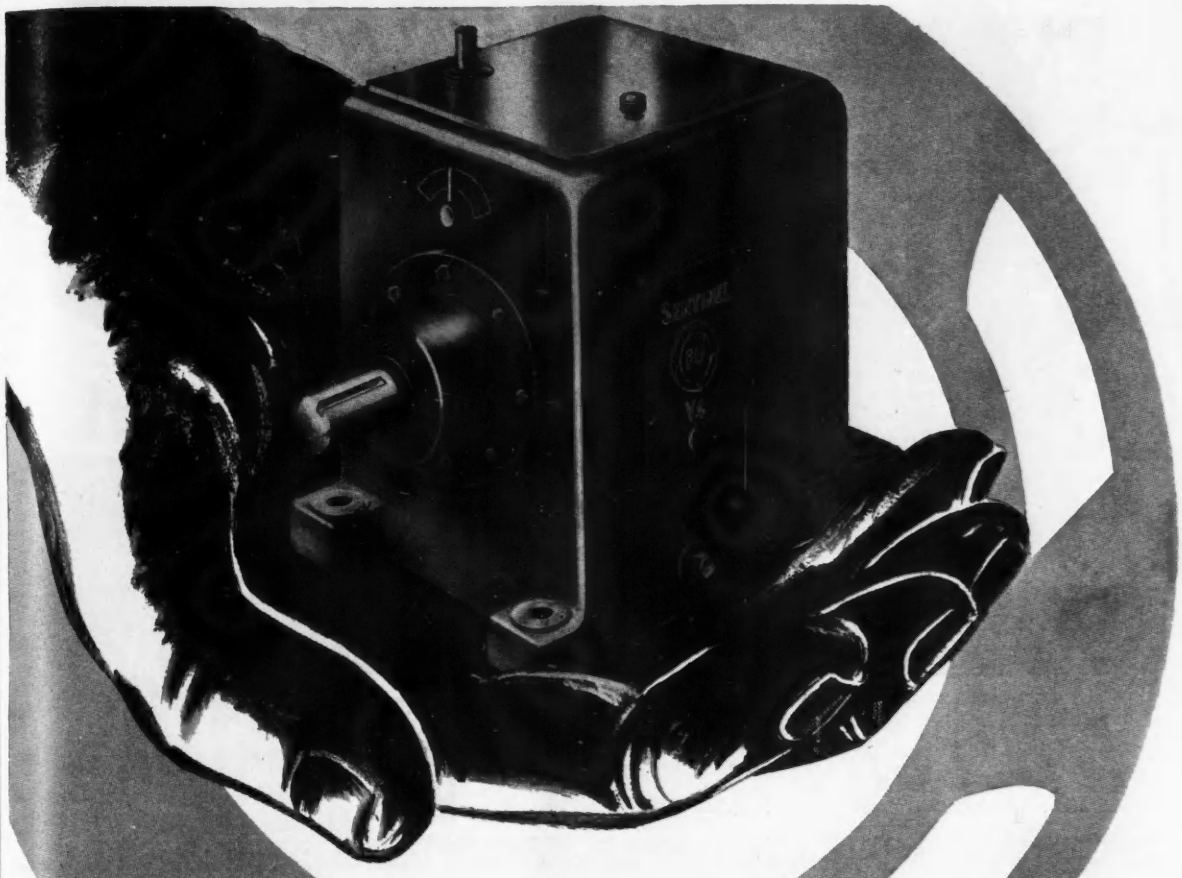
Steelhoist Works. Bristol 2. Tel: 77664.

STEELHOIST



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Sentinel "F.U." Variable Speed Units find their use in most industries inasmuch as they increase the output of any kind of machinery, improving at the same time the quality and finish of the product. Because of the increased output obtained the economy effected quickly offsets the cost of the unit.

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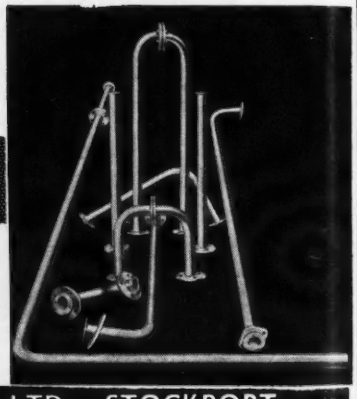
We have supplied pipework to the gas industry for many years and have special facilities for handling emergency requirements.



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FOR LABOUR-SAVING AND EFFICIENT SPRAYING

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The special feature of this pump is that the pump bucket works entirely outside the liquid.

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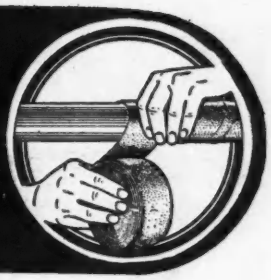

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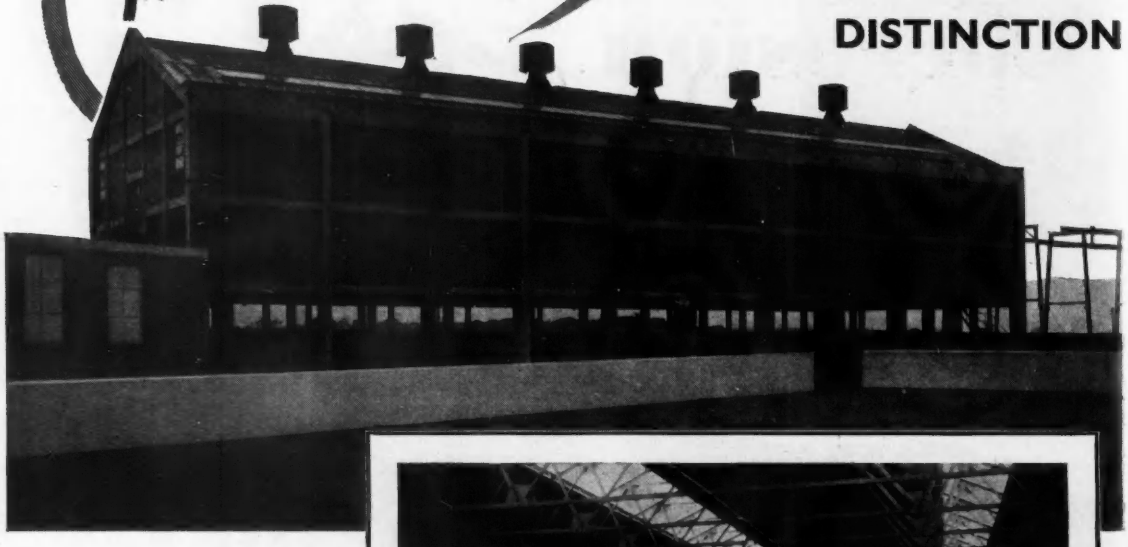

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COMPLETE INSTALLATIONS

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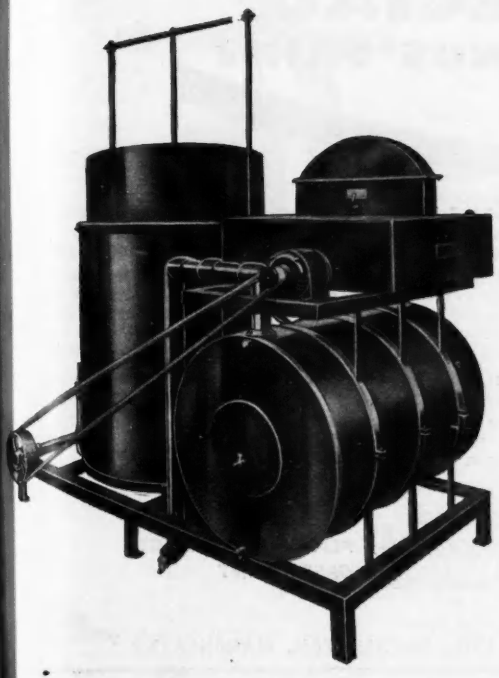

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SPECIAL VI-TERNUS PAINT

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VI-TERNUS costs very little more than many non-resistant paints which have a considerably shorter life.

At present this paint is available only in the shade of Permanent Foliage Green, since this has proved to be the only shade capable of withstanding the fumes and also retaining its colour.

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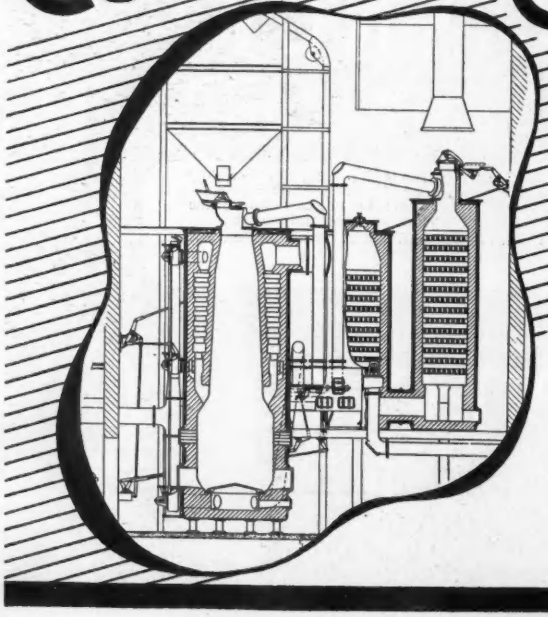

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NO. 35 B : *IMPROVED HIGH PRESSURE FORCE PUMP FITTED WITH TWO STAGE PUMP, INSTANTANEOUS PISTON RELEASE COCK, 300 lbs. PRESSURE GAUGE.*

MULTIPLE SCREWED ADAPTOR CAN BE SUPPLIED WITH EITHER PATTERN.

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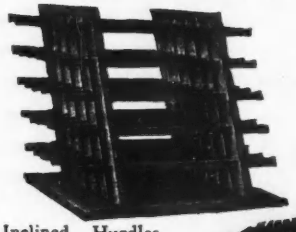
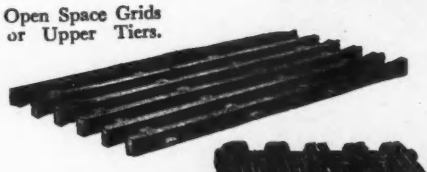
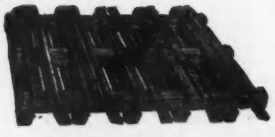


Inclined Hurdles (Light or Heavy Type) with Bottom Flat Grids.

Scrubber Grids.

Open Space Grids or Upper Tiers.





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Flat Grids for Bottom Tiers (Closed Ends).

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Embody the latest improvements—are of the very best quality—and are in use extensively throughout the Kingdom

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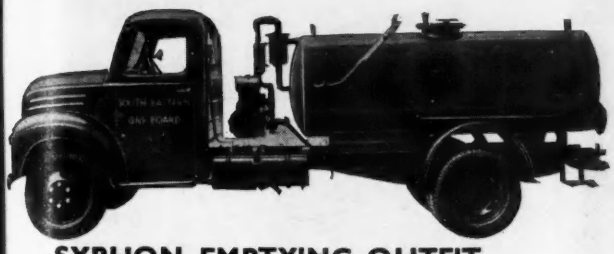
ALLAN TAYLOR

MAINTENANCE OUTFITS FOR GAS COMPANIES



SYPHON EMPTYING OUTFIT

The vacuum syphon emptying outfit illustrated is mounted on a 4-ton Fordson chassis. A 600 gallon galvanised tank is fitted. A rotary type exhauster is driven by a 2¼ h.p. four stroke hopper cooled engine, mounted on a sub-frame behind the cab. The tank is fitted with a flame-proof vent and the outfit can be used for high or low pressure syphon emptying. A large manhole at the rear allows the tank to be cleaned easily.

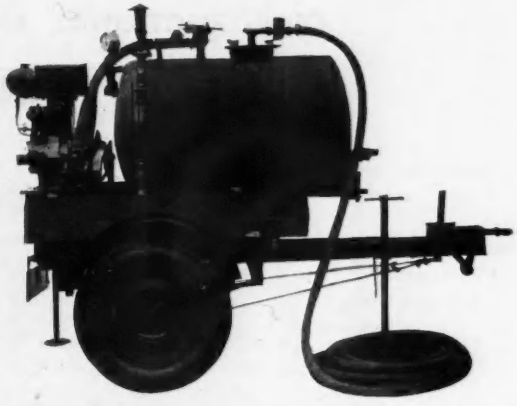
A sight glass is fitted to enable the operator to know when the the syphon is emptied. 25-ft of 1½ in. suction hose is supplied with outfit. The outfit can be used for vacuum or pressure working.

Full particulars and illustrated pamplet sent on request

ALLAN TAYLOR (Engineers) LTD

WANDSWORTH HIGH STREET · LONDON · S.W.18

Telephone: PUTNEY 6431 (Four lines)

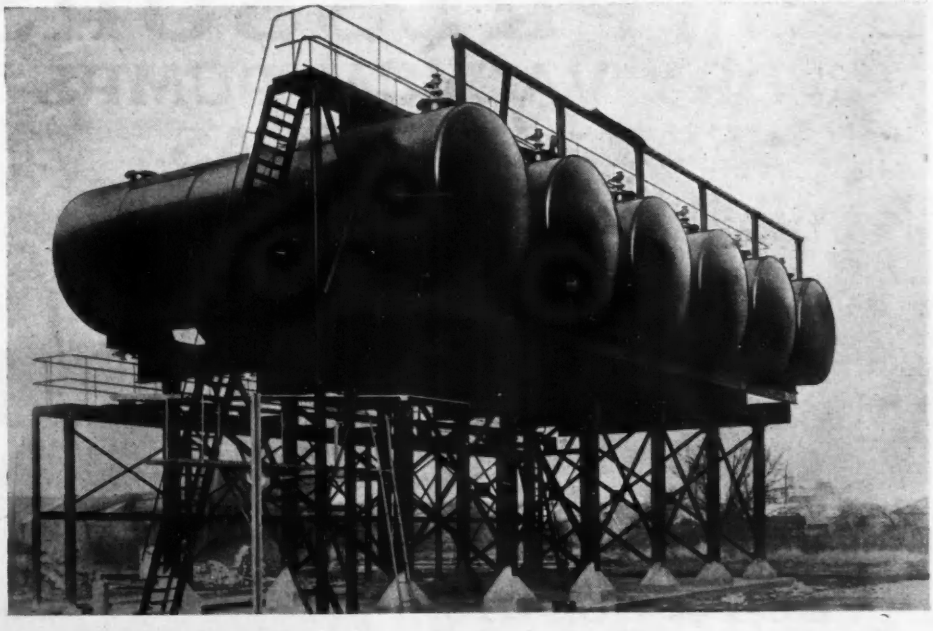


SERVICE PIPE CLEARING OUTFIT

Trailer model fitted with 75-gallon galvanised tank and a 2¼ h.p. engine driving an exhauster. Vacuum or pressure can be obtained by simply moving two levers. Safety valves are employed and come into operation when pressure in the tank reaches 8/10 lbs. The tank is tested to 30 lbs. A 27-in. vacuum is obtained in 2 minutes.

The outfit can also be used for emptying syphons and an automatic liquor valve is fitted to prevent the liquor reaching the exhauster. In addition to the vacuum and pressure gauge a sight gauge is fitted to enable the operator to see at a glance the exact amount of contents in the tank. 60 ft. of 1 in. hose and necessary couplings supplied with each outfit.

SULPHURIC ACID TANKS AND STRUCTURE



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COMPRESSORS
& DRY VACUUM PUMPS FOR AIR OR GAS.

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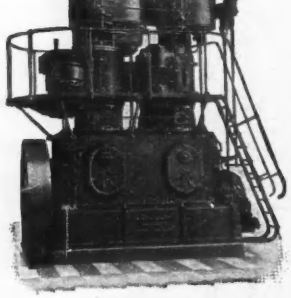
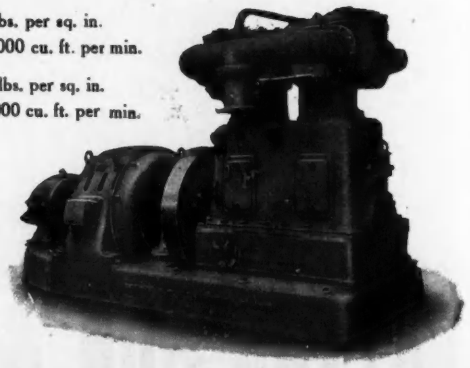


These double-acting cross-head type Compressors are provided with forced lubrication. They may be driven by any suitable power unit, as shown below, or by steam cylinders in tandem with the compressor cylinders making a self-contained unit, as shown on the left.

Single Stage. Pressures up to 40 lbs. per sq. in.
Capacities up to 10,000 cu. ft. per min.

Two Stage. Pressures up to 120 lbs. per sq. in.
Capacities up to 5,000 cu. ft. per min.



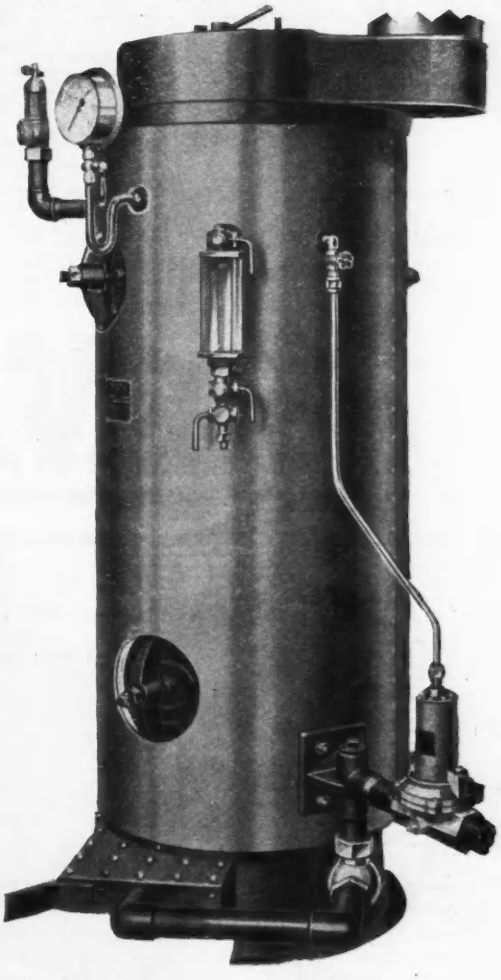
For particulars of these machines and for other types write (mentioning this journal) to:—

REAVELL & Co., LTD.,
Ranelagh Works, Ipswich.

Telegrams: "Reavell, Ipswich." Telephone Nos. 2124 & 2125 Ipswich.

Compact gas fired steam boiler units of high thermal efficiency

Pressure up to 100lbs. per sq. in.



Complete combustion is achieved in the Brockhouse Gas-Fired Steam Boiler by the Special Air Induction Tube, which regulates the amount of air admitted to firing tubes. All steel body with riveted side and end plates ensures long life. Boilers are available in a range of sizes from 30-400 lbs. of steam per hr. Installation is simple as boilers can be connected to existing gas and water supplies.

The Brockhouse Automatic Condensate Return System can be supplied complete with drawing, wiring diagram and fixing instructions, ready for connection to steam condensate mains to give fully automatic control combined with economy and efficiency. Alternative water feed arrangements are available to suit any conditions.

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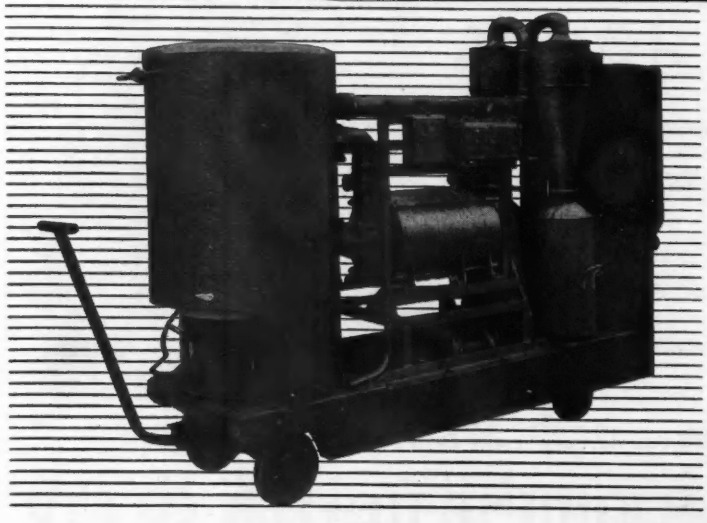
APPLY ROZALEX

B.V.C

Dual-purpose
GAS WORKS MODEL



The B.V.C. Dual-Purpose Gas Works Model T87 is a very efficient mobile unit with water-cooled container for the removal of hot dust from the tops of retorts. Can be used for general cleaning by either one or two operators. We shall be pleased to send you full information on request.

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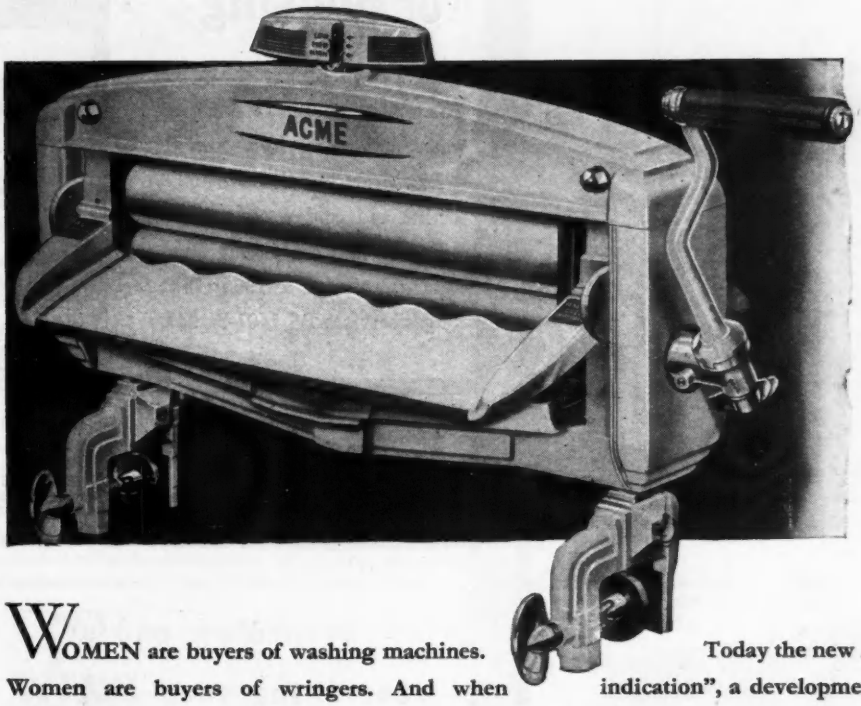
For full particulars apply to Dept. 63

The British Vacuum Cleaner & Engineering Co., Ltd., Goblin Works, Leatherhead, Surrey 'Phone : Ashtead 866

When washing machines are Acme-fitted

then women know they're buying the best . . .



WOMEN are buyers of washing machines. Women are buyers of wringers. And when women think of wringers they think of the Acme. So when your machines are Acme-fitted your customers know that they must be, like the Acme, the best on the market.

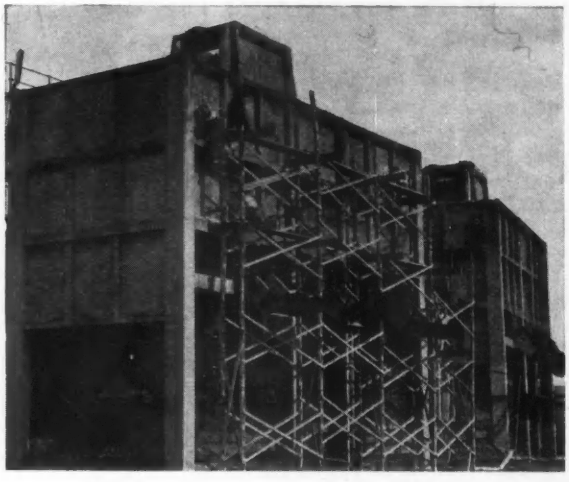
Seventy years of good, solid British manufacturing, skill, research, and experience stand behind each Acme—and generations of women know this to be true. Acme is the perfect expression of real and continuous progress in the history of wringing. Thus, every feature for which Acme is famous, has sprung from a known need; has been tested, tried and found successful before it leaves the factory.

Today the new Acme has "pressure indication", a development which, by assuring the correct pressure for every kind of fabric, takes the guesswork out of wringing. Silks, cottons, woollens, linens, now receive exactly the right pressure needed to extract water, expel embedded dirt and preserve the life of each fabric. Thus wringing is made simpler and easier.

Acme does a better job, lasts longer and gives the best results. That's why Acme's reputation is world wide. That's why more than four million women have chosen an Acme in preference to all others. That's why, when your washing machines are Acme-fitted, women know they're buying the best.

ACME WRINGERS LIMITED DAVID STREET GLASGOW SE

Gunite



One of the reinforced concrete structures reconditioned with Gunite for the City of Carlisle Gas Undertaking.

Gunite—concrete applied by air pressure has numerous applications where its great density and extreme adhesion have exceptional value.

For repairing reinforced concrete it has particular merit, as, due to the method of application, a uniform density and adherence is obtained whenever Gunite is applied.

For lining coal bunkers and steel chimneys it possesses great resistance to corrosion and protects steel-work from the abrasive action of coal or coke.

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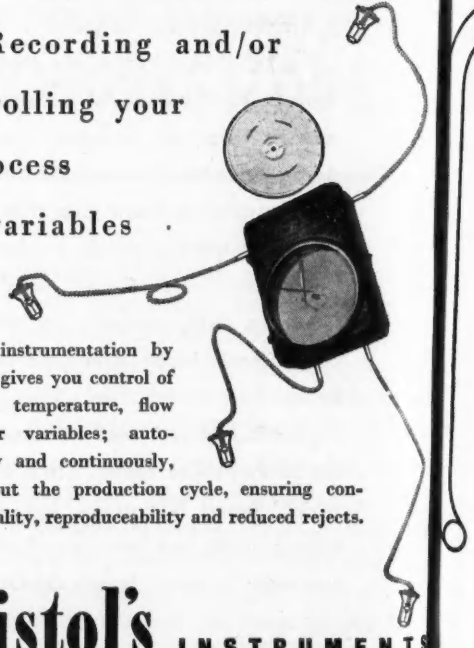

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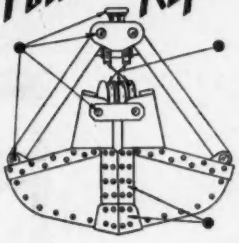

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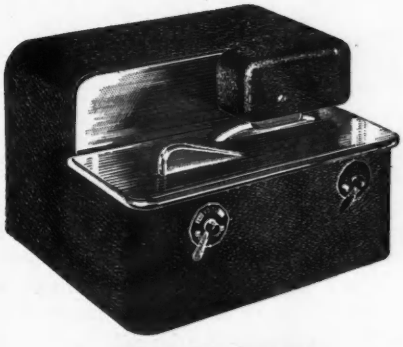

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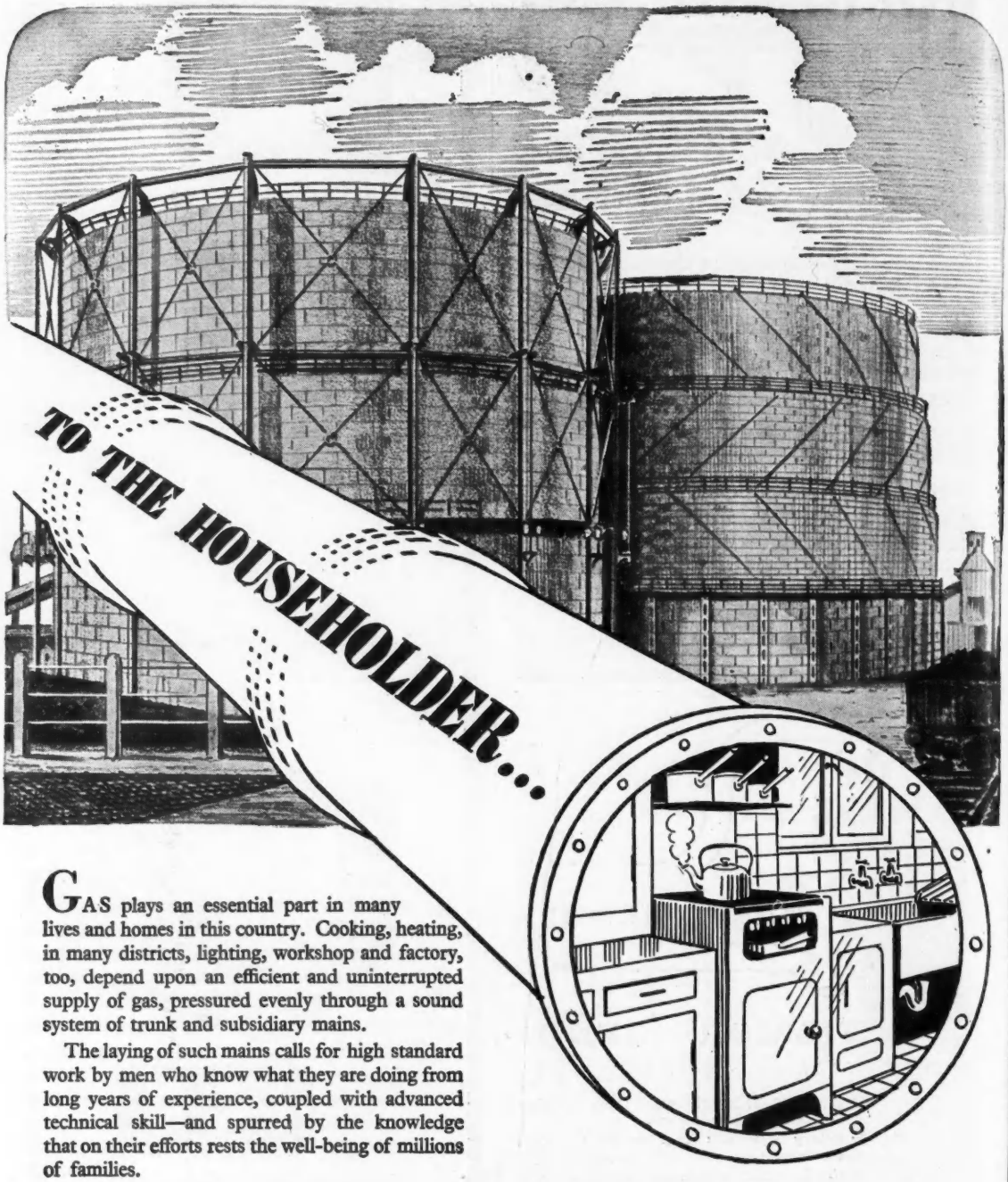

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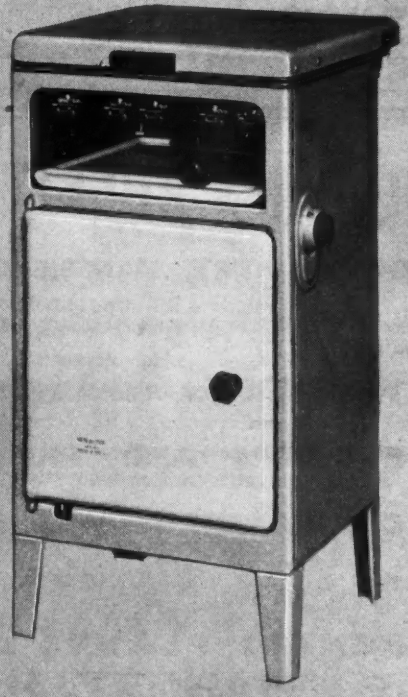

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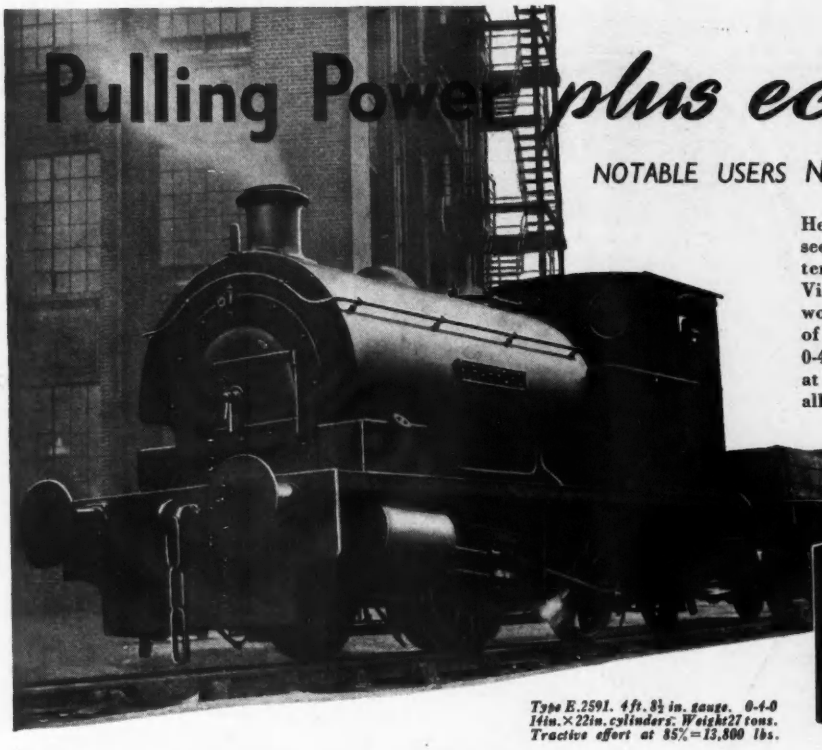

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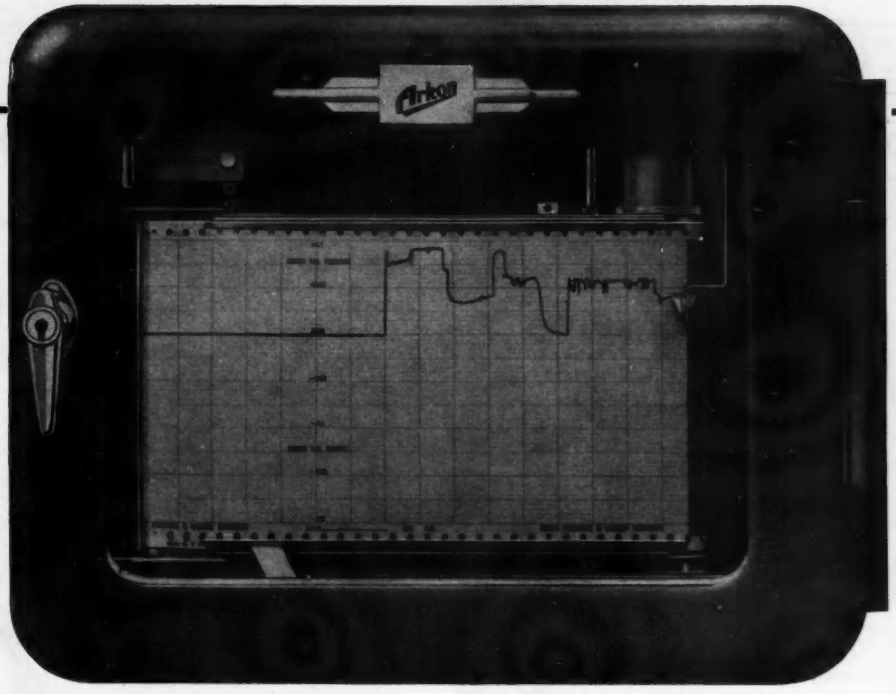

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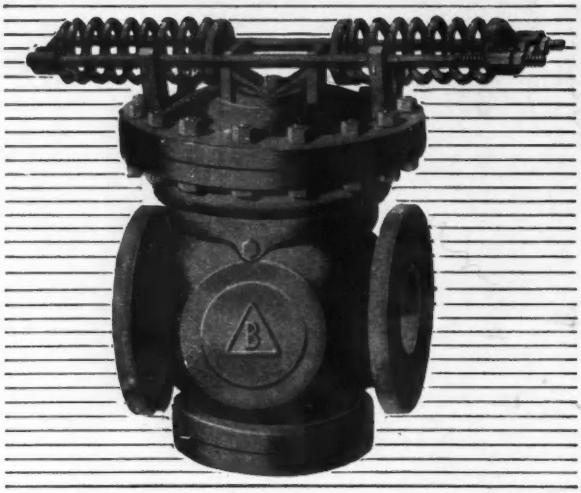

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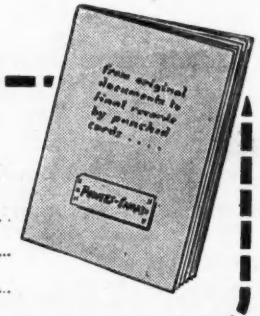

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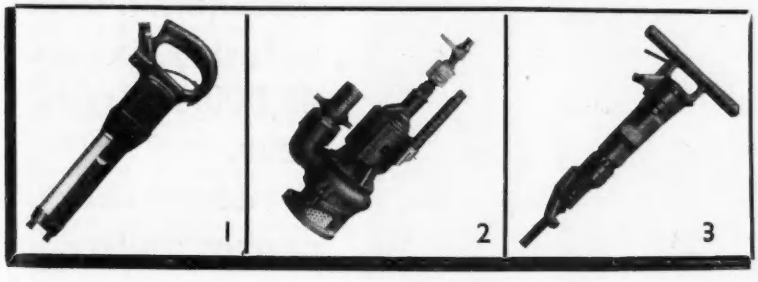

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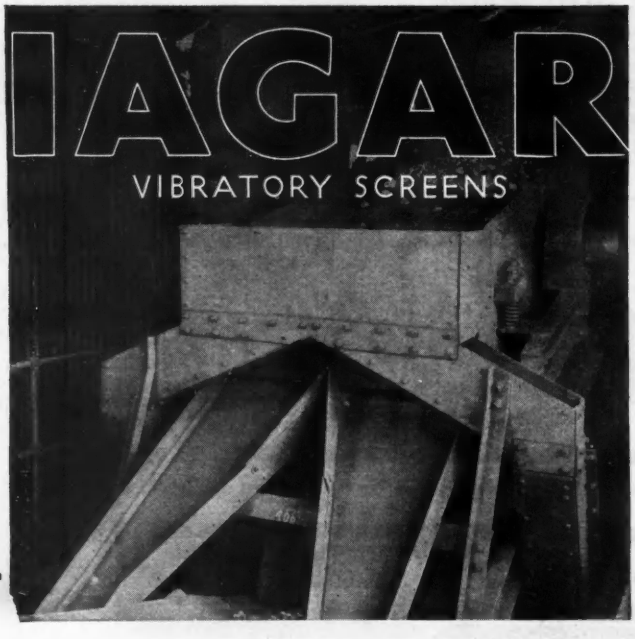

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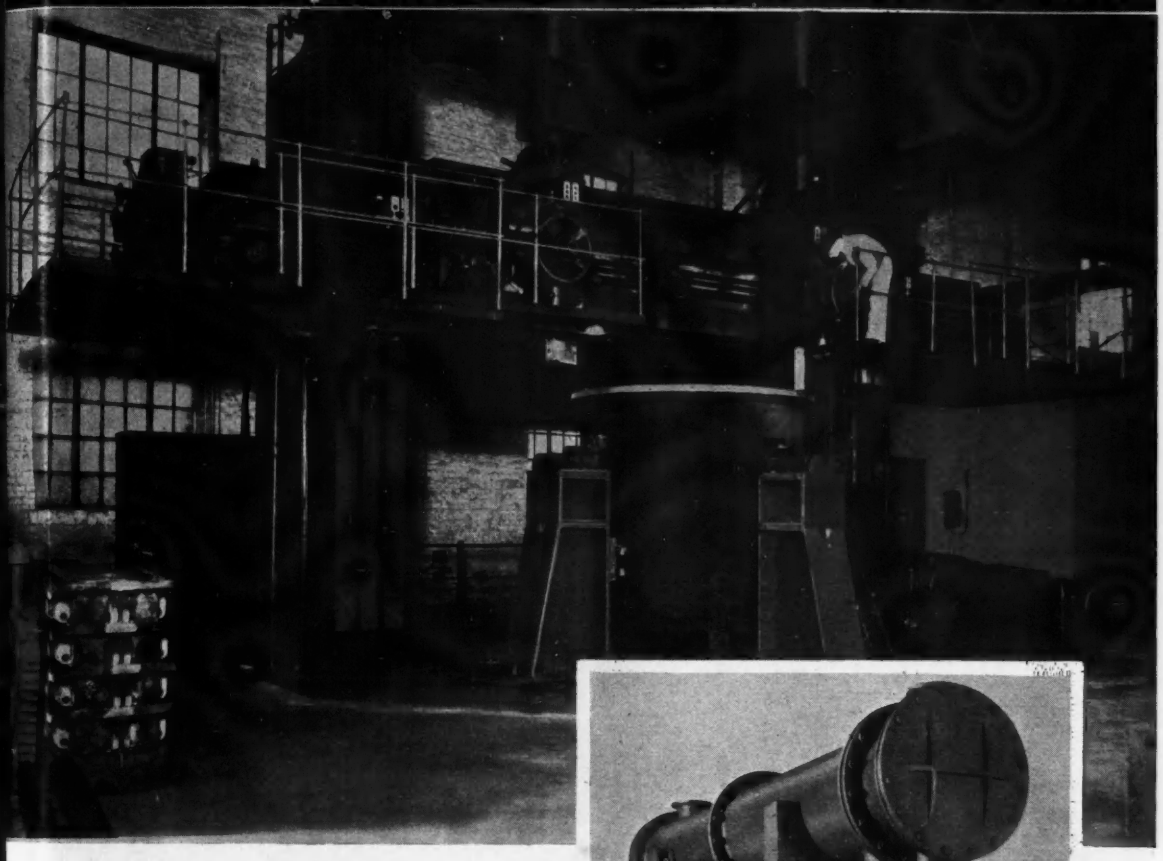

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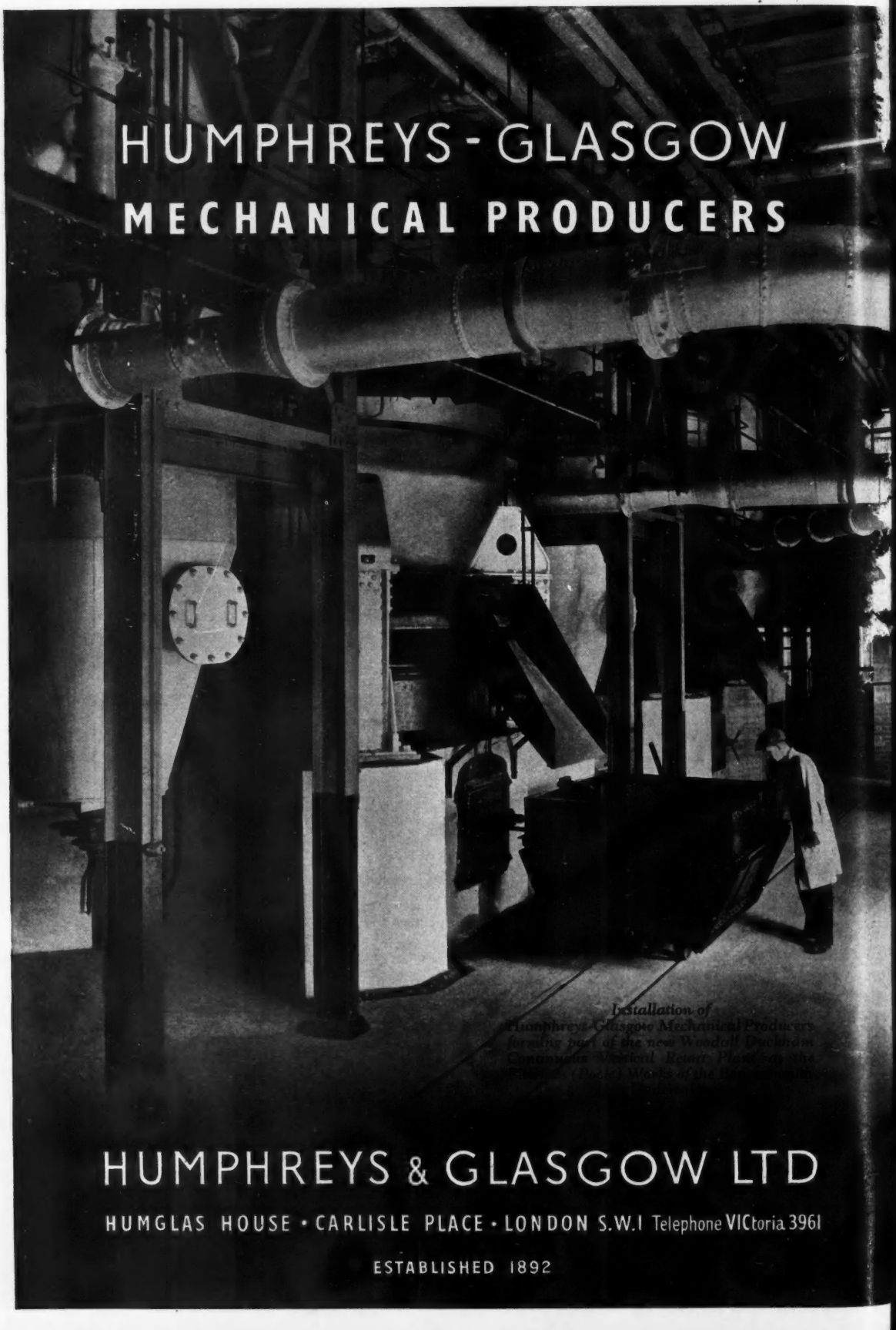
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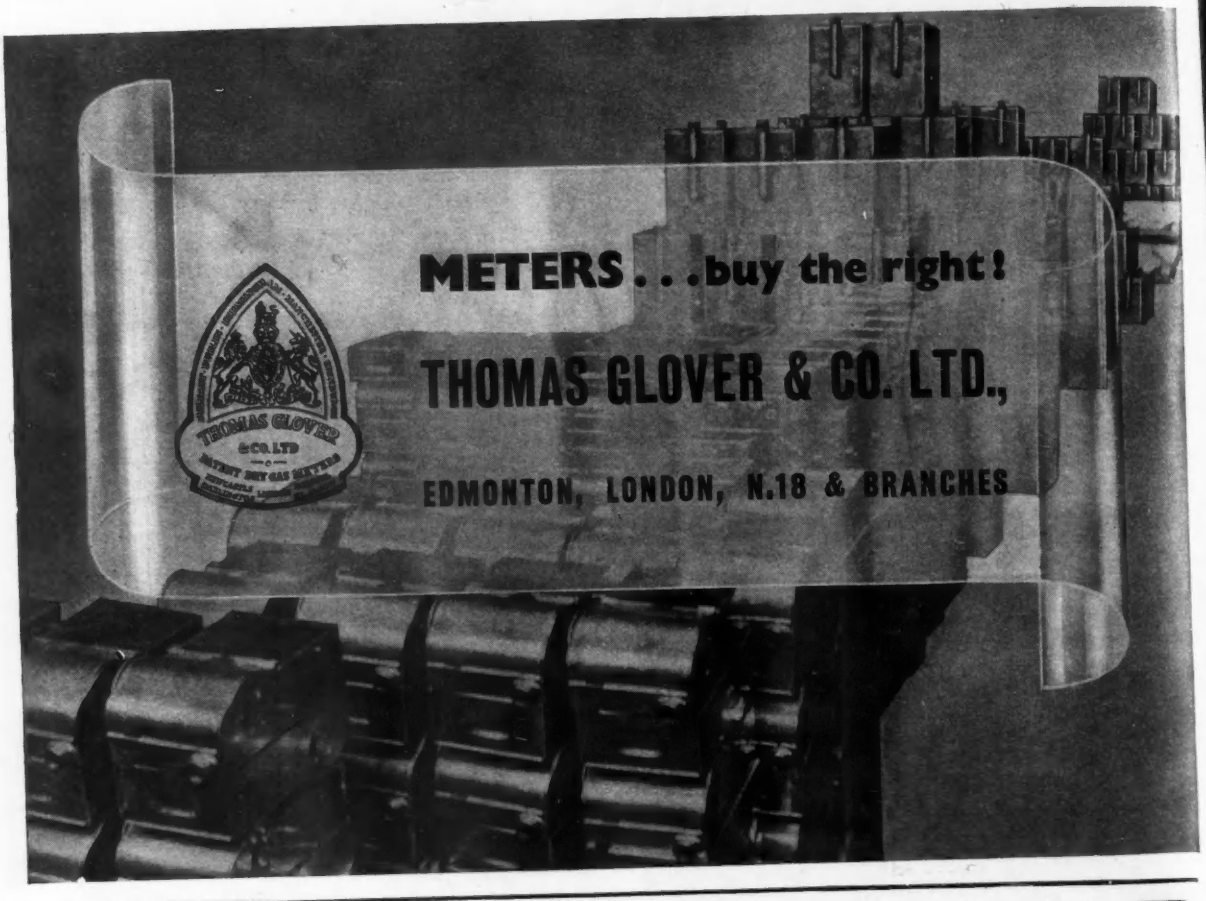

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GAS JOURNAL

VOL. 263. No. 4555 102ND YEAR SEPTEMBER 20, 1950

GAS INDUSTRY RESEARCH

UNDER this title on p. 500 is an important announcement of the steps which have been taken by the Gas Council to implement its nationalisation obligations in regard to research laid down by section 3 (Part 1) of the Gas Act, 1948. As a minor refresher we quote from the Act:—'It shall be the duty of the Gas Council to settle from time to time in consultation with the Minister a general programme of research into matters affecting gas supply and carbonisation and other matters affecting the functions of area boards or the Gas Council.' And the section went on to state that the Council could itself conduct research or make arrangements with other people to carry on the good work. Area boards, it was made clear, could (*a*) conduct research according to Gas Council directive, (*b*) carry on with individual programmes.

From the announcement it will be seen that the Gas Council has set up a research committee to be responsible for advising the Council on all matters connected with research, for drawing up programmes of research, and for reviewing progress from time to time. The Chairman of the Committee is Sir Edgar Sylvester. The strength of the committee can be gauged from the announcement, membership including one of the most eminent chemists and one of the most eminent physicists in this country today. It will be noted at once that the membership does not include a representative of the Gas Research Board; nor does it include any representation from that side of the gas industry which makes and supplies gas-making plant or gas-using appliances. We do not favour big committees, with frequent meetings and intolerable inaction; but we think that the committee might have included representation from the spheres we have mentioned. That Dr. Harold Hollings is at the moment Chairman of the Gas Research Board hardly supplies the solution to our suggestion. Dr. Hollings, who is Controller of Research to the North Thames Gas Board, has joined the new Gas Council research committee as Director-designate of the Council's London Research Station (the existing laboratories of the North Thames Gas Board having been recognised as the nucleus of the new Station, and he has our good wishes in his additional work. It is the intention of the Council to establish two more research stations, but this is looking to the future. Immediate thought centres on London.

Responsible opinion will be entirely with us when we say that no better nucleus for the Gas Council's plan for its own conducted research exists than the organisation built up during the past half-century at Fulham through the vision and drive of Sir David Milne-Watson; and under the new plan we look to the merging of the shades of Sir David and Dr. Charles Carpenter among others. But what of the future of the Gas Research Board with its headquarters at Beckenham? In the course of an interview with Sir Edgar Sylvester on Friday last he assured us that the Gas Research Board, as a distinct and separate entity allied to the Department of Scientific and Industrial Research, would continue to receive all appropriate support from the Gas Council (which, of course, means the supply of the necessary funds) and that the staff of the Board would not be thrown upon the streets of common adventure.

That there will be much comment on the Gas Council's plans for research, plans now taking concrete shape, we have no doubt. But we think that criticism will be on points of detail and not on questions of broad principle. A start to the cementing of gas industry research has been made within the nationalised regime, and to our mind the prospects are good—given co-operation and understanding. The Gas Council's research may be looked upon as a necessary focal point, the programme being arranged as a result of first-class advice. The area boards themselves will conduct research on their particular problems—into such matters affecting the functions of the boards as are not included in the general programme of the Gas Council (*vide* section 3 of the Gas Act). The boards will develop research in their own interests, and the total accomplishment will accrue to the benefit of the gas industry *qua* industry. And the pace of the development to the proper final issue—the interest of the community and of national economy—will not be made in the laboratory, however many original germs the test tubes and their beholders may hold, but by the lessening of time-lag in the practical application of research. In this regard we look to the Gas Council to give directives, to transform mild recommendations into stark realities.

IMPENDING FUEL CRISIS

CONSUMPTION of coal in this country is going up. The gas industry is exhorted to make more and more gas for industry, and in a similar way the electricity industry is urged to generate more power. With the gas industry the margin of plant is perilously small, and the Government's allocation of £32 mill. for capital expenditure will not go very far. Generally, the margin of safety in coal supply, small as it is, is diminishing. Coal stocks at gasworks are not what they were a year ago, and no doubt the gas industry will be encouraged to use more oil for gas-making during the coming winter—at a price! So far this year inland consumption of coal has exceeded consumption in the same period last year by over 3,400,000 tons, whereas output of coal from the mines and opencast workings has exceeded last year's output by only 1,900,000 tons. It is salutary to recall that in 1937 output from deep mines averaged 4,600,000 tons a week, whereas in 1949 it averaged 3,900,000 tons a week. Recently the Parliamentary Secretary to the Ministry of Fuel and Power, Mr. Alfred Robens, underlined the danger and warned of an impending fuel crisis. Stocks of coal at the end of last month were a tenth less than they were at the same time last year. The number of miners is nearly 24,000 less than it was a year ago. The present output per manshift is below the average for the last four years before the war; absenteeism is now almost what it was during the period 1935-38.

The view has been put forward that the only prospect of betterment lies in an increase in the number of miners and an improvement in their attendance at their work. But are these the only means of improving the situation? It is, of course, right to lay stress on the production angle. In reverse, it is wholly wrong to disregard the utilisation angle. Far too little emphasis, we think, is given to the economic use of coal, either in its solid form for steam raising in industry generally or in gaseous form, the product of the carbonising industries. We do not in the least belittle the work of the Fuel Efficiency Committee of the Ministry of Fuel and Power, but we may well ask whether that work does not at the present juncture command more attention at the start and demand new methods of approach in its application. There can be no lively satisfaction till it can be shown that all industrial users of coal are not only enthusiastic about the efficient use of coal but can rest certain that this enthusiasm is, in fact, being translated every day into practice. During the war Sir Ernest Smith made fervent pleas for economy in the utilisation of coal and gas—economy to be reached not by lower output of manufactured articles, but by greater efficiency in using the coal and gas available. Since the war Sir Ernest has been untiring in his endeavours to arouse not spasmodic but continuous interest in the matter, believing that wholesale economies could be effected today. We hold in this regard not that more might be done but that more must be done to mitigate the impending fuel crisis.

COAL FINANCE

WHILE coal stocks remain below safety level the National Coal Board's statistical statement for the second quarter of 1950 affords ground for only limited satisfaction. The figures reveal a net profit of £2,451,971 after providing for interest and interim income and profits tax, a result which is more than £3 mill. below the record surplus of £5,600,011 in the first quarter of this year and £40,000 less than the surplus earned in the second quarter of 1949, though slightly above the quarterly average for the whole of last year. Colliery results for the quarter (which include the effects of the Easter and Whitsun holidays) indicate a total saleable output of 50,083,774 tons compared with 49,320,711 tons for the second quarter of 1949. Total costs of production are provisionally estimated at £113,431,442, representing 45s. 3.6d. per ton of saleable coal mined against 45s. 2.2d. last year. Proceeds are estimated at £120,160,413, or 47s. 11.8d. per ton, against 47s. 9.2d., leaving a profit, before charging interest, of 2s. 8.2d. per ton, or a fraction under 1¼d. per ton over the 1949 figure.

The wages bill amounted to £73,601,229, or 29s. 4.7d. per saleable ton of coal produced, showing a saving of 2d. per ton compared with the same period of last year. Average weekly earnings of workers in the industry, including the value of allowances, were 35s. 1.7d. per manshift or 179s. per wage earner per week, against 171s. 9d. a year ago. The net deficit remaining in the board's accounts after the second quarter is reduced to £4,084,826. Actual colliery profits for the quarter before deducting interest or tax were £490,000 higher at £6,931,971, but the estimated interest payable to the Minister of Fuel and Power is £450,000 higher at £3,750,000, and provision for estimated liability for profits tax is £80,000 higher at £730,000. The quarter's profits were helped by an increase from 4,220,767 to 4,746,936 tons in the tonnage of coal for export and ships bunkers.

INERTS IN COAL

SOME of the problems confronting the gas industry, together with other branches of the carbonising industry, were discussed in a symposium of three papers presented to the Fourth World Power Conference. Two of these deal with the increased inert content of coals, its cause and its effects. Dr. G. E. Foxwell and Mr. C. Johnson (Coal Officer to the Gas Council) led off with a statement of the desirable qualities in the coals available to the industry. The gas industry in particular must face the fact that the coals formerly supplied are not likely to be available much longer. It is putting it very mildly to say that there is reason to believe that coals of somewhat lower rank will be gradually introduced into the carbonising industries. Dr. Foxwell set out the qualities of the gas coals we should like to get —with volatile matter between 30% and 36% on the dry basis, low inherent moisture, ash content not exceeding 6% (dry basis), and swelling of medium-strength. Dr. King's classification of first and second choice of gas-making coals are set out.

High ash content is probably the worst feature of coals

now being supplied to gasworks. The ash content of the resultant coke is about one and a half times that of the coal from which it is made, but the consequences are more serious than that. It weakens the coke and has a deleterious effect on its combustible qualities. It at once increases the heat required for carbonisation and reduces the output of the producer. Inherent ash will always be with us. It is a matter of economics whether adventitious ash should be removed at the colliery or transported to the carbonising works. Dr. Foxwell outlined the difficulties—the increase of the proportion of dirt and fine cuttings of stone in machine-cut coal, the indiscriminate loading of coal and stone on to conveyor belts, and the increasing practice, perhaps unavoidable, of spraying, adding to moisture content which itself impedes cleaning. There is also the point that while, as Dr. King has shown, great reserves of gas coal are still available, it is coming to the surface in quantities likely to decrease rather than to increase, while much is diverted, in an imperfect distribution system, to other industries.

Dr. Foxwell is optimistic enough to suggest that the present high inert content of coal may be a passing phase. Dr. J. Burns, Chief Engineer to the North Thames Gas Board, whose contribution is published in this issue of the *Journal*, however, shows the ill effects of the deterioration of quality even in the coals going to his board. He indicates that the reduction of thermal yield is even greater than would be inferred from the greater inert content of the coals. These coals come from two main sources, the Durham coalfields and those of Yorkshire and the Midlands. Inerts in the Durham coals have increased by over 2% by gross weight of coal in the last 10 years, mostly during the war years, while those in the second category have increased by 3% in the same period. Over the whole working of the Gas Light and Coke Company coal gas yields went down by four therms per ton whereas a loss of only two therms would be directly proportional to the loss of pure coal per ton. The reduction of thermal yield in the water gas plants is still more out of proportion. A weighted increase of 2.5% in ash content of the coke has resulted in a reduction of 7% in thermal yield.

Dr. Burns suggests three factors in an explanation of this disproportionate loss. More coal is stored in the summer and reclaimed in the winter than before the war and there may be an increase in deterioration in stock which, we may remark, has been shown to be more rapid in the first few months of storage than at a later time. Then there is the indirect effect on the carbonising process due to increased ash in producer fuel with consequent lower combustion chamber temperatures. While this second effect might be allowed for in the construction of new plant it is easy to see that in existing plant it tends to be an active cause of deterioration in results. 'It is interesting,' he says, 'to note that the deterioration shown by results of large-scale carbonising . . . coincide reasonably with the deterioration indicated by the results obtained from the assay tests.' It is interesting also to note that even here the deteriorations are not proportional.

A contribution to the discussion of the economic question whether to clean at the pit or to suffer in the retort house is the estimate that the loss due to the deterioration in coal cleanliness, if it is general throughout the country (and we should say it is worse than that), must amount to about 100 mill. therms per annum, besides the loss in material and labour in the handling of inert material and in producing the required quantity of gas in the plant available.

PUBLIC LIGHTING

THE Association of Public Lighting Engineers, whose founders were drawn mainly from the gas industry, but whose present membership shows a strong leaning towards electricity, has paid gas a high compliment in appointing as its President for 1950-51 Mr. Philip Richbell, Distribution Engineer of the East Surrey Division of the South Eastern Gas Board, who for 25 of the 43 years he has spent in the industry has been actively associated with the scentific and administrative aspects of public lighting. Mr. Richbell, who has been a member for 21 years, has seen many changes not only in the Association but in public lighting generally, and he devoted part of his Presidential Address at Bournemouth to a review of recent changes in the Association's constitution enabling the area boards of both the gas and electricity industries to become group members. He sees a promising future for the Association under the new conditions which have arisen since the nationalisation of the two industries and hopes to see its status raised to that of an institution, involving compulsory examination before admission to membership.

At the opening of the century paraffin and flat flame gas burner lamps were the only commercial forms of artificial illumination in use for street lighting, and the developments which have taken place even within the 25 years of Mr. Richbell's lighting activities have matched the progress in road transport and other activities with which good lighting is directly concerned. Keen competition between the gas and electricity supply industries has been backed by commendable enterprise on the part of the manufacturers of lighting equipment, whose trade organisations are represented in the Association. Mr. Richbell's review of the changes that have been wrought in the first half of the century is of historic interest. Throughout this week there is an exhibition of lighting equipment in Bournemouth.

UNIFORMITY OF PRICING

As mentioned briefly in our Gestetner issue last week, in about three months from now the Northern Gas Board will bring into force a new system of gas charging which will go a long way towards area unity in the important matter of pricing. First steps are to be a published price for each district in the area and—very interesting, this—the introduction universally of a two-part tariff. The first 30 therms will be at the published price and further gas for the quarter at two-thirds price (small reduction on very large quantities). Ordinary domestic meter rents will be abolished and supplementary charges for prepayment installations will be equalised throughout the area. The scheme was endorsed by the Northern Gas Consultative Council this month, when the question of maintenance service was also raised. The problem has been considered by the divisional general managers of the area and the conclusion has been reached that any re-introduction of a system of regular 'uninvited' visits of inspection of consumers' appliances would necessitate a large increase in trained staff and would mean an increase in the price of gas on this account. In its place

is a service which gives immediate attention on application by the consumer. This system is in the nature of a half measure. It may well lead to a falling-off in the performance of appliances of which the consumer may be quite unaware or, if aware, may tolerate rather than trouble to report. It is, of course, more than merely desirable that full publicity should be given to any 'on demand' service of the kind. Reverting to the tariff decision we recollect what happened when, in 1936, the South Metropolitan Gas Company introduced a compulsory three-part tariff. There was a public outcry and the Company bowed to the storm, without, however, in any way modifying its belief that the principle of the system of charge was thoroughly sound and equitable. A Joint Committee of the House of Lords and the House of Commons was set up to enquire into the matter and it accepted the evidence that a flat rate was inequitable and that only by spreading the charges over a larger supply was it possible to cheapen the price of gas to all classes of small consumers. In view of public opinion at the time the South Met, as we have said, withdrew the compulsory tariff. An optional two-part tariff was introduced in 1938.

Letters to the Editor

COKE OVENS ON GASWORKS

DEAR SIR,—I was interested in your editorial comment of August 23 on the paper given by MM. Boulin and Verret on the use of coke ovens at gasworks, particularly regarding the claim about the flexibility of coke ovens due to their ability to change from rich gas to producer gas firing. Your comment reads :—

> 'It seems to us that this triumphant claim shows a callous disregard of the intrinsic value of town gas, as the highest grade of true fuel, which must be staggering to the British gas engineer.'

If you take the cost per therm of the rich gas used to fire the ovens—*i.e.*, unpurified and without distribution charges—and compare this with the cost of producer gas for the same purpose, you will find that the British gas engineer will not be nearly as staggered as you think—in fact, in certain cases he might even be staggered in reverse! It is not the price of gas to an outside consumer which is being considered in this case, but the cost into holder less purification costs.

Yours faithfully,
R. J. BARRITT.

'Fairbank,'
Tredomen,
Hengoed, Glam.
September 15, 1950.

ARE PREPAYMENT CONSUMERS OVERCHARGED ?

DEAR SIR,—One of the principal duties laid upon the area boards is the collection of sufficient revenue to cover their costs, and many are the problems involved in formulating schemes which will ensure the equation of these opposing factors. As far as the structure of sales prices is concerned there is, I believe, a growing acceptance of the idea that as far as possible each consumer should pay for those costs which are incidental to his custom. It is easy to say that kind of thing, but less easy to sort the costs into sufficiently clear-cut groups to be sure that each service to the consumer is debited with its proper share.

The various prices at which gas should be sold depend on a wide range of factors; the quantity and incidence of the load seem to be the chief points in fixing price scales. So far as supplies of gas to domestic consumers are concerned, the price of gas *per se* must be the same, and as the costs incidental to the serving of ordinary and prepayment consumers are, broadly speaking, the same, this is as it should be.

When, however, the income from the hire of such things as meters, fittings, and appliances is being considered, there is often a considerable amount of confused thinking in evidence. Ordinary consumers have to be told on their gas accounts exactly what they are being asked to pay for. Gas charges are based on meter readings and any further charges for meter rents and appliance rents have to be rendered for precise amounts. In the case of prepayment consumers, however, the amount they are liable to pay is often an unknown quantity, depending entirely, in some cases, on the quantity of gas they consume. The curious thing in these cases is that the more they burn the more they pay for the hire of the meter, etc. The principle of discount for quantity works in reverse.

The industry talks of supplements as a sort of feature of selling gas through prepayment meters and has come to rely on a very substantial revenue from good consumers who contribute quite considerable sums in excess of the economic rent of the rented items.

This is not the whole story, however.

I am not sure how far the industry is justified in charging for what are referred to in Acts of Parliament as 'fittings' when the fittings are no more than the odd pipes, sometimes nowadays serving only a cooker (the lighting fittings having long been replaced by electricity). The question the industry has to solve is a peculiar one because it knows that if the consumer changes from a slot meter to a credit meter it can no longer levy a charge for the hire of fittings unless there happen to be some specific lighting fittings which are in use in the house.

It is common knowledge that consumers do change from slot to ordinary, and every time this happens the undertaking forfeits revenue which it knows full well cannot be collected from the ordinary consumer (assuming there are no lighting fittings).

It seems curious, to say the least, that the cost of the gas supply service to two very similar classes of consumer should be so different. I know that Acts of Parliament give the industry the right to recover from slot consumers so many pence in respect of rents on every therm consumed, but surely it is time that the basis of charge for rents was rationalised.

I realise that it is one of the traditions of the industry that the bigger slot consumers subsidise the rents of the smaller consumers. The latter have often been referred to as poor consumers, the term 'poor' being used ambiguously to indicate small or poverty stricken according to the user's preference. Traditions die hard, but now seems to be the time to make a break with the past if this thorny problem is ever to be settled. Good slot consumers are entitled to as square a deal as their ordinary counterparts and ways and means are surely not beyond the contrivance of the industry to see that they get it.

To sum up : (a) If rents for fittings are not payable by an ordinary consumer they should not be expected or budgeted for from the slot consumer, even if this means that the lost revenue must be collected in some other way—e.g., by a slight increase in the price of gas; (b) whatever rents are payable by slot consumers should be expressed in terms of so much money per annum and not so many pence per therm consumed; (c) any money in excess of the proper rents payable should be repayable to the consumers in the shape of rebate.

The practical measures to implement the above proposals would include the publication of annual rentals due, with a statement as to the alternative methods of collection which could be by payment to the collector of any balance by which the cash in the meter falls short of the amount required to cover the gas charge plus the rents for the period of the collection, or by the installation of a meter fitted with a clock mechanism and a separate slot for the insertion of coins to cover meter rents only, so that the consumer could get no gas until he had prepaid his rents.

It is manifestly absurd that the prepayment consumer should pay rents which are not collectable from the ordinary consumer or that a prepayment consumer who ought to be getting a discount for large consumption should be called upon to subsidise the uneconomical consumer's rents.

If the problem is dealt with now, it should result in dispelling the very real sense of grievance which many prepayment consumers feel that they are paying through the nose compared with those consumers who pay their accounts quarterly.

Yours faithfully,
ACCOUNTANT.

September 7, 1950.

In the Report for 1949 of the Ministry of Works (H.M. Stationery Office, 1s. 3d.), it is explained that efforts have been made to widen the interest of the building and civil engineering industry and the professional institutions concerned in pre-stressed concrete. A travelling exhibition illustrating the uses and value of the material visited cities and towns throughout the country during 1949 and was well received. The Ministry has also an observer on the Pre-stressed Concrete Development Group, which is representative of manufacturers, architects, engineers and contractors, and research workers in the universities and elsewhere. The object of the Group is to encourage the development and use of pre-stressed concrete, especially by making generally available discoveries of new uses, new methods and so on.

Personal

Mr. **F. Harvey,** General Manager of Cannon Iron Foundries, Ltd., has been appointed to the Board of Directors.

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Mr. **H. C. Higgs** (Basingstoke), Councillor **J. L. L. James** (Weymouth), and Alderman Mrs. **D. M. A. Crompton,** M.B.E., J.P. (Winchester), have been appointed members of the Southern Gas Consultative Council.

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Mr. **H. A. R. Binney,** C.B., an Under-Secretary of the Board of Trade, has been appointed Deputy Director of the British Standards Institution, and will be taking up his appointment next month.

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Mrs. **Dean Chander** asks us to convey through our columns her grateful thanks to the many who have written to her in her bereavement and to say how much she appreciates the tributes to the memory of her late husband.

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Mr. **Christopher Wendell,** outside representative of the former Sunderland Gas Company, and later with the Northern Gas Board, who has retired after 44 years' service, has been absent from work only twice through illness.

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Mr. **Thomas Nicklin,** Production Engineer to the North Western Gas Board, has been awarded the degree of M.SC. in Chemical Engineering. Mr. Nicklin obtained his B.SC. (London) and M.I.CHEM.E. some time ago, and is a Member of the Institution of Gas Engineers. As the subject of his M.SC. thesis Mr. Nicklin chose 'The Effluent Problem of the Gas Industry.'

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Mr. **E. J. Walters,** A.C.I.S., Assistant Secretary of the Gas Council, was married to Miss Evelyn Bailey at Ilford on September 16. On Thursday at Gas Industry House he was presented by Mr. F. G. Brewer, Secretary, on behalf of the staff, with a cheque and inscribed blotter as a token of his colleagues' good wishes. Before joining the Gas Council Mr. Walters was with the Association of Gas Corporations and the Severn Valley Gas Corporation.

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Sir **John Green,** a member of the East Midlands Gas Board, has intimated to the Minister of Supply that he is prepared to accept office as Deputy Chairman of the Iron and Steel Corporation to be set up under the Steel Nationalisation Act. Sir John is also a Director of Thomas Firth and John Brown, Firth Brown Tools, and other companies, Chairman of the Central Conference of the Engineering and Allied Employers' National Federation, and Vice-Chairman of the East and West Ridings Regional Board for Industry.

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Mr. **James Park,** Administrative Assistant at the Manchester headquarters of the North Western Gas Board, has been awarded the degree of LL.B. (external) of London University. This achievement, for which Mr. Park had to work in his spare time, represents his third qualification. In 1947 he became an A.C.I.S. and in 1948 an A.C.W.A. An old boy of Preston Grammar School, Mr. Park went to the board in 1949 from Solihull Urban District Council, where he had the post of Administrative Assistant. Previously he had served with the Lancashire County Council.

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Mr. **S. K. Patterson,** Deputy Engineer and Manager of the Galashiels and Selkirk undertakings for the past five years, has taken up a post with the Cambridge undertaking of the Eastern Gas Board. On the occasion of his leaving Galashiels he was presented with a set of suit cases, the gift being made by Mr. W. C. Campbell, District Manager, on behalf of the staff and employees. Mr. Campbell thanked Mr. Patterson for the special services he had rendered over a period which had been crucial in the affairs of the undertakings, and made special reference to the planning work done by Mr. Patterson in connection with the extensions to the Galashiels works required to meet increasing demand for gas and to provide bulk supplies to neighbouring undertakings.

WEST MIDLANDS APPOINTMENTS

Appointments recently announced by the West Midlands Gas Board include the following : G. H. Cooper (Hemel Hempstead Development Corporation), to be Assistant Chief Auditor, board headquarters; H. J. Lorton (Solihull), Senior Accountancy Assistant, headquarters; H. A. Edkins (Birmingham), Personal Assistant to Sales and Service Manager; D. Webster (Birmingham), Senior Cost Clerk, Walsall Division; H. B. Crossley (Sheffield and Rotherham), Distribution Draughtsman, Smethwick Group; L. G. Oakes (Halesowen Borough Council), Chief Clerk, Cradley Heath; G. W. Harvey (Bristol), Assistant Engineer, Lichfield and Tamworth; S. H. Lawrence (Ellesmere Port), Engineer, Walsall; R. C. Fellows (Birmingham), Deputy Chief Clerk, Prepayment Rental Section, Birmingham; S. E. Fisher (Birmingham), Credit Rental Clerk, Birmingham; J. Bridle (Smethwick), Chief Clerk, Smethwick Group; W. S. Hewitt (North Thames), Deputy Divisional Accountant, Birmingham Division; L. Gibson (Worcester), Sales Superintendent, Stourbridge; W. E. G. Robinson (South Eastern Gas Board), Assistant Electrical Engineer, Birmingham.

Obituary

Mr. **George R. Rushton,** Engineer and Manager of the Buckie undertaking (Scottish Gas Board), died on September 15 at Stirling Royal Infirmary, to which he had been removed after being taken ill while on holiday at Alva, his native town. He was 49 and had held similar posts in Wales, and at Lochwinnock, Renfrewshire, before he took up his Buckie appointment in 1938.

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DEAN CHANDLER

Mr. T. F. C. POTTERTON writes :—

Dean, as he was familiarly known by his close friends, had a most generous nature, always ready to give help and advice to others upon matters in which he was so well versed. Independence of judgment was a natural gift of his, while his whimsical smile added to his charm, making him a delightful companion, for even in his many moments of banter he was nothing if not friendly to those with whom he might for the time being be at variance on an issue.

Many will miss him—none more than I shall after being privileged to know him for nearly 40 years.

Mr. D. M. HENSHAW writes :—

Having had a long association with Mr. Dean Chandler with many interests in common, I would like to add my tribute to his memory and join with others in recognising the very great service he has rendered the gas industry in many directions.

My association with him has in recent years been particularly in connection with the Gas Gallery which was first proposed by the late Mr. Thomas Hardie in conjunction with myself. Mr. Dean Chandler rendered very great service both before and after the war in conjunction with Mr. E. G. Stewart to the Technical Sub-Committee, and by his enthusiasm succeeded in keeping the work going up to the time of the project being handed over to the Institution of Gas Engineers, and later under the Chairmanship of Mr. F. M. Birks.

Dean Chandler's kindly disposition and interest in the welfare of his friends endeared him to all, and he will be very much missed.

Mr. A. DOUGLAS LACEY writes :—

Others better qualified than I am to assess the outstanding professional qualities of Dean Chandler will doubtless do so. I would like to pay my humble and affectionate tribute to him as a colleague and friend.

Outside the close circle of his family and intimate friends few I think have more cause to bear him in grateful remembrance than myself. During the past five years I have been in continuous and close association with him in a project in which we were both very deeply interested, the recording of the history of the gas industry from its inception. The collaboration was indeed a happy one, clouded only during the latter months by my realisation of the gravity of the distressing illness he bore with such bright courage and fortitude.

Dean Chandler was quite unafraid of death. 'It is,' he has frequently said to me, 'no more than walking from this room to the next.' We who mourn him are grateful for the gift of his friendship and example, and when our own turn comes to pass into that 'next room' may he be among the first to greet us.

GAS INDUSTRY RESEARCH

One of the major duties placed on the Gas Council, as the central advisory, co-ordinating, and financial body of the gas industry, is the organisation and conduct of research. To assist it in the discharge of this function, it has set up a Research Committee, to consist of three eminent men of science not engaged in the gas industry, three members of the Council, the President for the time being of the Institution of Gas Engineers, the Livesey Professor for the time being at Leeds University, and the directors of the Research Stations (probably three) which it is intended to establish.

The Chairman of the Committee will be the Chairman of the Gas Council, Sir Edgar Sylvester, K.B.E.

Two scientific members have been invited and have agreed to join the Committee, Sir Robert Robinson, O.M., F.R.S., and Sir Cyril Hinshelwood, F.R.S.

Sir Robert Robinson, who has been Waynflete Professor of Chemistry at Oxford University since 1930 and President of the Royal Society since 1945, has held professorial chairs in organic chemistry in many universities in this country and in the Commonwealth overseas. He was President of the Chemical Society from 1939 to 1941, and in 1947 was awarded the Nobel Prize for Chemistry.

Sir Cyril Hinshelwood has been Dr. Lee's Professor of Chemistry at Oxford since 1937. He was President of the Chemical Society from 1946 to 1948. The Royal Society awarded him the Davy Medal in 1943 and a Royal Medal in 1947.

The three members of the Gas Council who will serve on the Committee are :—

Mr. E. Crowther, Chairman of the Northern Gas Board.

Dr. R. S. Edwards, Chairman of the North Eastern Gas Board.

Mr. W. K. Hutchison, Chairman of the South Eastern Gas Board.

The President of the Institution of Gas Engineers for the current year is Mr. F. M. Birks, C.B.E., Deputy Chairman of the North Thames Gas Board, and the Livesey Professor at Leeds University is Professor A. L. Roberts, PH.D., F.R.I.C.

The existing laboratories of the North Thames Gas Board have been recognised as the nucleus of the London Research Station and Dr. H. Hollings, F.R.I.C., who has for some years been Controller of those laboratories, has joined the Committee as Director-designate of the Station.

This Research Committee will be responsible for advising the Gas Council on all matters connected with research, for drawing up programmes of research, and for reviewing progress from time to time.

Diary

Sept. 21.—North British Association of Gas Managers: Annual General Meeting, Oban.

Sept. 22.—Northern Junior Gas Association: Visit to West's Gas Improvement Co., Ltd.

Sept. 22-23.—North Eastern Gas Board: First Annual Conference of Senior Officials, Scarborough.

Sept. 27.—Industrial Gas Development Committee: Gas Research Board offices, The Abbey, Southend Road, Beckenham.

Sept. 27.—Coal Industry Society: Sir John Cass College, Aldgate, E.C.3. Lecture by J. Stanleigh Turner, 'Self Help in the Coal Trade,' 6.30 p.m.

Sept. 28.—North Thames Gas Consultative Council: St. Ermin's Hotel, Westminster, S.W.1, 2.30 p.m.

Oct. 3.—South Eastern Gas Consultative Council: Quarterly Meeting, 4-6, Wandsworth Road, S.W.8, 2.30 p.m.

Oct. 6.—London and Southern Junior Gas Association: 'Gas in Catering,' A. S. Williams (Headquarters Division, North Thames Gas Board), Lecture Theatre, North Thames Gas Board Offices, 178-180, Edgware Road, W.2, 6.30 p.m.

Oct. 6.—North of England Gas Managers' Association: Autumn General Meeting, Croft Spa Hotel, Croft Spa, Darlington, 11.30 a.m. Visit to works of Whessoe, Ltd., 2 p.m.

Oct. 7.—Yorkshire Junior Gas Association: Annual General Meeting, Metropole Hotel, Leeds, 2.30 p.m. Address by H. F. H. Jones, Chairman, East Midlands Gas Board.

Oct. 7.—Western Junior Gas Association: Visit to Devonport gasworks, Plymouth, and paper, 'The Economy and Efficiency of C.W.G. Production,' F. T. Scantlebury (Devonport).

Oct. 10.—Coal Industry Society: Sir John Cass College, Aldgate, E.C.3. Lecture by Sir Ernest Smith, C.B.E., 'Your Future in Fuel,' 6.30 p.m.

Oct. 11.—Society of British Gas Industries Golfing Circle: Autumn and Annual General Meetings, Richmond Golf Club, Sudbrook Park.

Oct. 13.—Northern Junior Gas Association: Visit to West's Gas Improvement Co., Ltd.

Oct. 24.—British Road Tar Association: Annual Dinner, May Fair Hotel, Berkeley Street, W.1, 7.30 for 8 p.m.

Oct. 24.—Southern Association of Gas Engineers and Managers: Final meeting of the Association and first joint meeting of the London and Southern Section and the South Western Section of the Institution of Gas Engineers, Connaught Rooms.

Oct. 25.—London and Southern Junior Gas Association: Visit to Fuel Research Station, Greenwich, 2.15 p.m.

Oct. 25.—British Coke Research Association: Conference, Royal Society of Arts, W.C.2, 2 p.m.

Oct. 26.—North Thames Gas Consultative Council: St. Ermin's Hotel, S.W.1, 2.30 p.m.

SCIENTIFIC GAS-MAKING

In the photograph on the left Sir Harold Hartley, President of the British Association for the Advancement of Science, is seen (centre) examining a model of the Coventry gasworks at an exhibition which he opened at Birmingham University in connection with the Association's meeting. On his left is Mr. G. le B. Diamond, Chairman of the West Midlands Gas Board. The Gas Council collaborated with the board in staging the gas section of the exhibition. The right-hand photograph is of a model of a new gas turbine using waste heat on a closed cycle principle. The turbine will take waste heat from the installation of Glover-West continuous vertical retorts to generate sufficient electrical energy to run all the plant at the Coventry gasworks.

News in Brief

Shortage of Gas Fitters in New Zealand.—The Manager of the Invercargill (N.Z.) City Council's Gas Department reported to his Council recently as follows: 'We are now in a desperate position regarding gas fitters and at present have only one and an assistant to do all the fitting work.' The population of Invercargill is 30,000 and the department has 5,415 consumers.

Gasworks Valuation.—Valuation of Leven gasworks on nationalisation was so low that the town council took the matter to the Court of Session. Formerly estimated to be worth about £8,000, the undertaking was valued at £2,500. The town clerk had been informed that, as a result of the appeal, the gasworks will be given a gross value of £9,634, with a rateable value of £7,737.

Broken Street Lamps.—Liverpool City Lighting Committee is proposing to spend about £300 on a film dealing with the dangers of children breaking street lamps. Damage to lamps is costing the city £3,500 a year, and in a letter to school authorities asking for their co-operation in putting a stop to this wilful damage the Town Clerk has stressed the fact that such damage seriously impedes the police in the discharge of their duties. Damage is caused by catapult, airgun, and stone throwing, and apart from the lamps being broken even lamp standards are being damaged. The film when prepared will run in the city cinemas for about three minutes under the title of 'Hidden Enemy.'

The Coal Industry Society, in conjunction with the Sir John Cass College and the L.C.C. College for the Distributive Trades, has arranged two courses of lectures on domestic and industrial fuel, starting on Oct. 17 and closing on Mar. 7, 1951. The courses are intended for those over 18 years of age who are engaged in the sale and distribution of coal and are planned as a preparation, in conjunction with a third year tutorial course, for the examination in Solid Fuels of the City and Guilds of London Institute and the Institute of Fuel. Application for enrolment (fee for each course 30s.) should be made to the Principal, Sir John Cass College, Jewry Street, Aldgate, E.C.3.

Maintenance Workers' Wages.—The Gas Council met representatives of the Confederation of Engineering and Shipbuilding Unions on Sept. 14, to consider further an application from the Confederation for an increase in wages. An agreement was reached to advance scheduled rates by 1½d. per hour. Notwithstanding the agreement, some 600 maintenance engineers at five gasworks in the Eastern Division of the North Thames Gas Board came out on strike on September 16 for an increase of 4½d. an hour. The works affected were Beckton, Bow Common, Bromley-by-Bow, Stratford, and Romford. We learn as we go to press that the strike has spread to 12 stations and the North Thames Gas Board has warned consumers of a reduction in gas pressure in consequence.

The North Thames Gas Board is using on a wide scale a new 'Day-Glo' poster. The design of Mr. Therm lends itself admirably to the red glow of the new colour, which is most attractive on the black background.. It does in point of fact look as if Mr. Therm is *burning* to serve!

Council House Refrigerators.—At the meeting of Higham Ferrers (Northants) Town Council, on Sept. 5, it was reported that the Housing Committee is considering the installation of gas-operated refrigerators in council houses. The weekly cost to each tenant would be 1s. 7d., spread over a 10-years hire period. This cost would include installation and maintenance charges.

Unequal Gas Charges.—A complaint about the price of gas for central heating was reported at a meeting of the East Midlands Gas Consultative Council on Sept. 5 to have been received from W. K. Morton (Horncastle), Ltd., who compared the price of 6s. per 1,000 cu.ft. with 3s. 9d. charged at Lincoln. The secretary reported that the gas board had stated that the higher price at Horncastle was due to the fact that the local undertaking was not an economical one. Gas could not be supplied there at a cheaper rate for central heating when it was wanted for industrial and domestic purposes. The board's explanation was accepted.

Change of Address.—The British Vacuum Cleaner & Engineering Co., Ltd., announce the change of address of their subsidiary, B.V.C. Industrial Constructions, Ltd., from Africa House, Kingsway, to Terminal House, 52, Grosvenor Gardens, London, S.W.1. Also opened at the same address are the new export showrooms of the British Vacuum Cleaner & Engineering Co., Ltd., where a representative selection of products under the trade names B.V.C., Goblin, and Magneta is permanently displayed.

Leeds Building Week

The North Eastern Gas Board had a series of stands at the Hunslet Moor exhibition in connection with the Leeds Building Week (September 11-16). The display was planned specially to assist architects, civil engineers, building contractors, and others with similar interests, by giving opportunity to see examples of up-to-date and efficient methods of gas and coke utilisation and by providing technical information.

Prominence was given to new developments and trends, two examples being improved methods of flueing and whole house warming by ducted air. There was a representative range of domestic gas and coke burning appliances and large-scale kitchen equipment.

WEST MIDLANDS CONSULTATIVE COUNCIL

Since its first meeting on August 23, 1949, the West Midlands Gas Consultative Council has appointed a local committee for each of the seven divisions in the area of the West Midlands Gas Board, with an aggregate membership of 106. Our photograph shows the council, with Mr. G. le B. Diamond, Chairman of the Board.

Seated (Left to Right) Miss O. I. Layton (Acting Secretary); Mrs. E. O. Thompson, Birmingham; Mrs. E. Farran, Shrewsbury; G. le B. Diamond, C.B.E. (Chairman, West Midlands Gas Board); Councillor W. H. Malcolm, J.P. (Chairman, West Midlands Gas Consultative Council); Councillor S. J. Brown, Birmingham (Deputy Chairman of the Council); Councillor Mrs. M. Dale, Wolverhampton; Mrs. M. Jacob, J.P., Lichfield; Alderman B. Bilboe, Bilston.

Back Row (Left to Right) Alderman John H. Lewis, M.B.E., J.P., Birmingham; C. W. Parkes, J.P., Willenhall; R. Alec Maddock, Stoke-on-Trent; Alderman P. Williams, J.P., Stoke-on-Trent; Councillor H. Hewitt, J.P., Stoke-on-Trent; E. Duncan Brown, Birmingham; Councillor H. J. Paramore, Redditch; Councillor F. Fisher, West Bromwich; Councillor G. Tatton, Leek; W. M. W. Fell, Bridgnorth; Alderman W. Evanson, Newcastle-under-Lyme.

Eastern Juniors Visit Their President

Ladies' Day at Grimsby

MEMBERS of the Eastern Junior Gas Association, now nearly 120 strong, loyally supported their President, Mr. G. Davies, Distribution, Sales, and Service Superintendent of the North Lincolnshire Sub-Division of the East Midlands Gas Board, on the occasion of the 'Presidential and Ladies' Day' at Great Grimsby on September 16, the ladies also attending in large numbers. The area of the Association stretches from the southern extremity of the Eastern Gas Board's area to the northern corner of that of the East Midlands Gas Board, and considering that Grimsby is one of the most northerly outposts of the combined territory the attendance was particularly good. Many of those who attended the meeting had to make an overnight journey, and a tour of the illuminations at Cleethorpes on the Friday evening proved a popular though impromptu part of the proceedings.

The meeting was held in the demonstration theatre of the very fine showrooms of what was formerly the Great Grimsby Gas Company and, with the exception of the formal acceptance of the accounts, was confined to Mr. Davies Presidential Address, which will be published later in the *Journal*.

Lieut.-Col. **J. Kennington,** Sub-Divisional Manager, extended a hearty welcome to the members and their ladies—the latter departing immediately after assembly for a pleasure trip to Cleethorpes—and the accounts were adopted on the motion of Mr. **A. Rush** (Ipswich), seconded by Mr. **F. J. Denny** (Ipswich).

Following the presentation of the Presidential Address, Mr. **J. T. Brookes** (Norwich), Immediate Past President, moved a vote of thanks to Mr. Davies and said the address was one that would be kept by members for reference for a long time to come.

Mr. **A. D. Duxbury** (Peterborough), in seconding, said those whose chief interests were on the works were coming increasingly involved in the matters raised in the address.

After the meeting the members and visitors were the guests of the East Midlands Gas Board at luncheon at the Yarborough Hotel.

Grimsby's Progressive Works

Mr. **H. F. H. Jones,** M.B.E., J.P., proposed the toast of the County Borough of Grimsby, famous, he said, not only for its history and its fishing industry, but for fertilisers, biscuits, and one of the largest ice factories in the world. The East Midlands Gas Board had been fortunate in finding at Grimsby a progressive and up-to-date gas undertaking with a very successful record which was brought prominently to the notice of the townspeople and others on the occasion of the centenary a few years ago. He paid tribute to Colonel Wintringham, Chairman of the former Great Grimsby Gas Company, and said how fortunate they were to find Colonel Kennington in charge as manager of the Company; all who knew him regarded him not only with respect but with affection. They were also glad to find Mr. Davies, their President, in charge of distribution, sales, and service. Besides acquiring a successful undertaking, the board took over an enterprising and loyal staff, among whom he mentioned Mr. W. R. Smout, now Accountant for the whole of the Lincolnshire Division. Finally he mentioned the presence of the Deputy Mayor, who was also a member of the East Midlands Gas Consultative Council and therefore closely concerned with the service which the board sought to render to its consumers.

Councillor Mrs. **M. Larmour,** Deputy Mayor of Grimsby, responded to the toast, confessing that through circumstances which she could not control at the time she moved to her present house, she was not a gas consumer. Thanks largely to the persuasive powers of Mr. Davies, gas was extensively used on the industrial estates and in council houses, where housewives appeared to prefer gas to electricity for cooking. She admitted that she was not an admirer of the gasworks from the æsthetic point of view, but remarked that when the works was first erected it was well outside the town; the town had since grown round the works.

Largest Consumer

Mr. **E. H. Winch,** Cambridge Divisional Engineer, Eastern Gas Board, proposed the toast of the guests and welcomed the presence of representatives of the civic and business life of the ancient borough, senior members of their own industry from area boards and divisional staffs, the managers of many neighbouring gas undertakings, and old and new friends. He referred especially to the Deputy Mayor, Mr. E. Kirman, representing one of Grimsby's largest gas consumers, Mr. H. F. H. Jones, Mr. H. R. Hart, Commercial Manager of the East Midlands Board, Mr. R. H. Epps, Secretary of the Eastern Board, and the managers of the three sub-divisions of the Lincolnshire Division, Colonel Kennington, Mr. B. Clarke, and Mr. J. S. Marshall.

Mr. **E. Kirman,** J.P., Managing Director of Scribbans-Kemp, Ltd., replied on behalf of the visitors, remarking humorously that nationalisation had made little difference in that his firm's bill for over £1,000 worth of gas per month came in just as regularly as before.

Mr. **R. H. Epps,** Secretary of the Eastern Gas Board, also responded and referred especially to the President's remarks on leadership as a preface to the Presidential Address which he had given earlier in the day. He ventured to add that an essential qualification for leadership was loyalty—a quality which had been one of the reasons for the success of the industry over a long period of years. One of the duties of the area boards was to further the education of their employees. He believed the Gas Council had the matter under consideration and would shortly put forward an education scheme. It would devolve on everyone already in the industry to see that every newcomer had a real career in front of him.

Mr. **H. R. Hart,** Commercial Manager, East Midlands Gas Board, proposed the toast of the Association, of which he said he was not a member, although he was proud of his continued membership of the London and Southern Junior Gas Association.

Opportunities

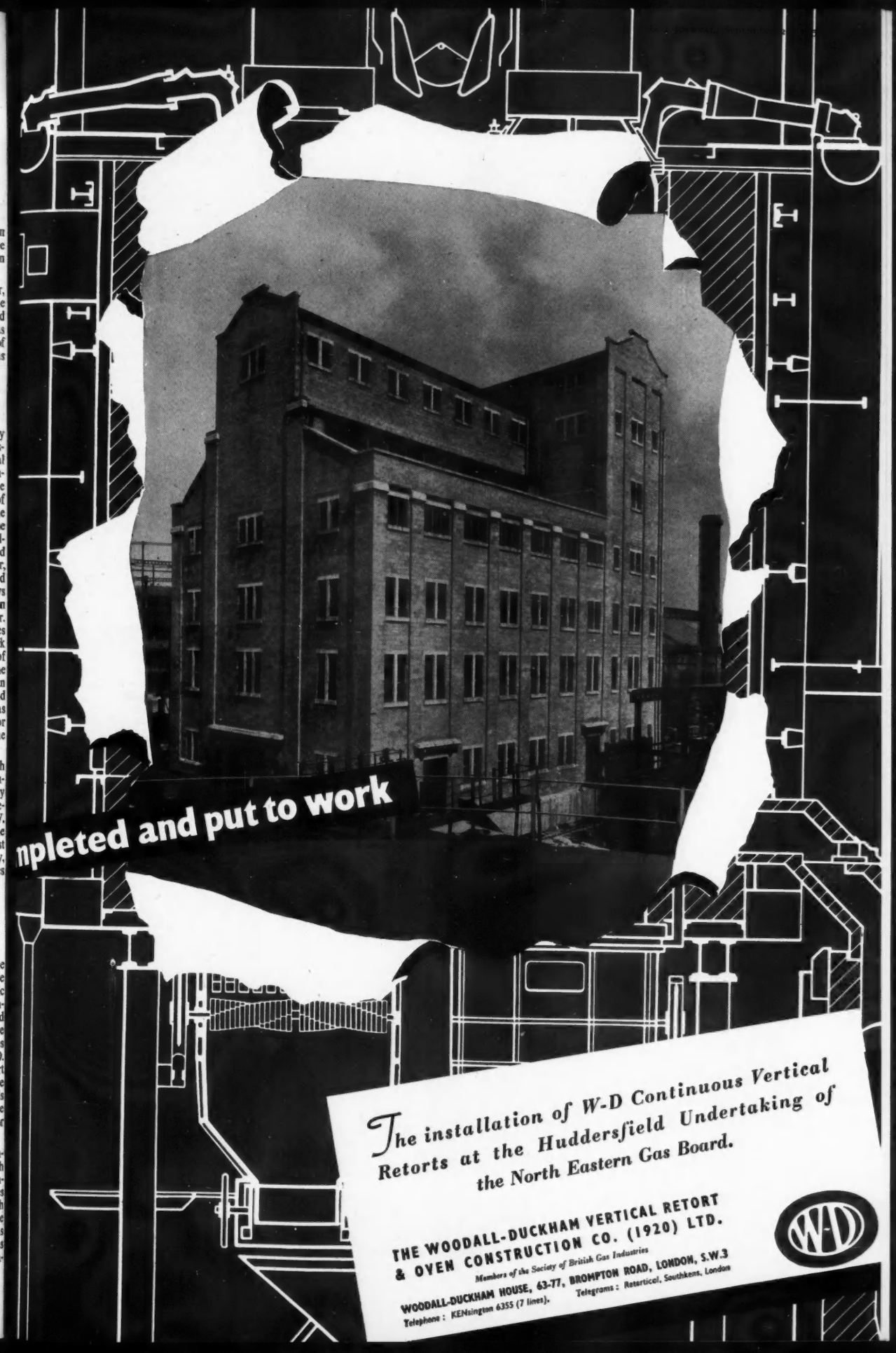
The **President,** in response, said that by reason of the fearlessness of their discussions the junior associations made a real contribution to the gas industry. Turning to a personal note he welcomed the presence of Mr. H. Spencer, Engineer of the Barnoldswick undertaking of the North Western Gas Board, to whose encouragement he owed his early advancement in the industry. He recalled Mr. Spencer saying to him as a youngster, 'Boy, try to climb the ladder,' and he had tried to follow his advice. In these days it was difficult to distinguish between seniors and juniors, but he felt with Mr. Epps that there were still opportunities for juniors who were willing to work hard and to give their superiors proof of their capabilities. Through Mr. Epps he wished to convey to Sir John Stephenson and Mr. J. H. Dyde, Chairman and Deputy Chairman of the Eastern Gas Board, the thanks of the Association for all the encouragement they had given the members.

The afternoon was devoted to a coach visit to the picturesque and historic Lincolnshire village of Tealby. The party returned to the Winter Gardens, Cleethorpes, for tea, after which Mr. **R. W. Hilham,** Secretary and Treasurer of the Association, expressed thanks to the East Midlands Gas Board for their hospitality, and presented a bouquet to Mrs. Davies as a mark of the members' esteem.

Purchase Tax

As part of its campaign to urge the Chancellor of the Exchequer to remove the 66⅔% purchase tax from domestic water heaters, the Northern Gas Consultative Council approached Sunderland Trades Council, which is representative of more than 50 trade union branches with a membership of well over 10,000. The Trades Council gave its full support but when the matter was referred to the North-East Federation of Trade Councils they rejected it because they felt there was little possibility of the Chancellor taking off the tax.

Sunderland Trades Council was informed in a letter from Alderman Joseph Hoy, Chairman of the consultative council, that there were thousands of homes with no piped supply of hot water which might be remedied by the removal of the tax. Convinced that a good case has been made out, the Trades Council has referred the matter back to the Federation for further consideration.



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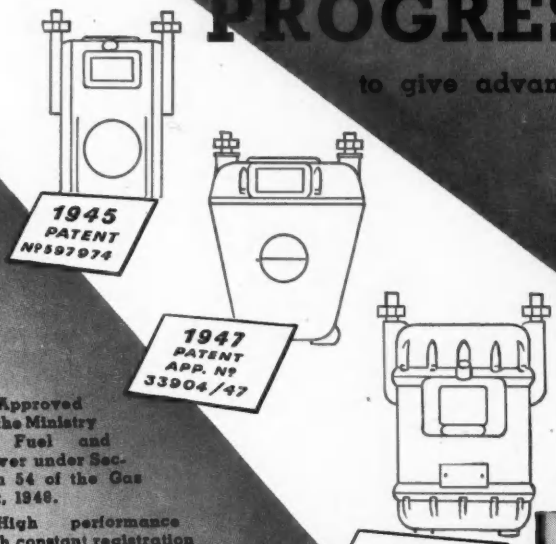

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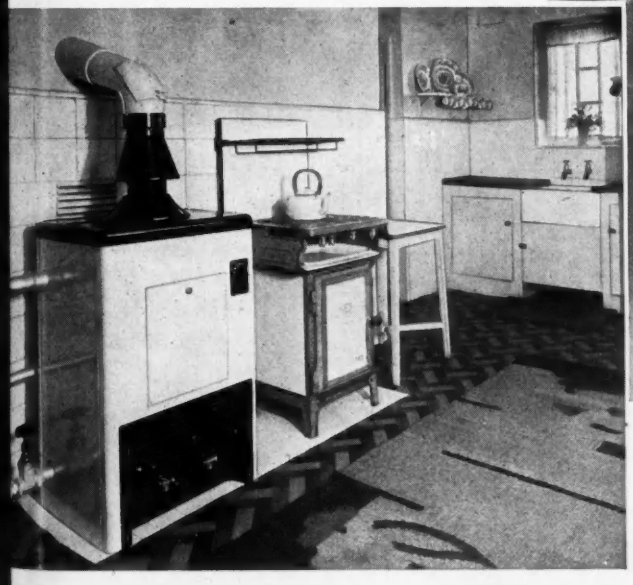

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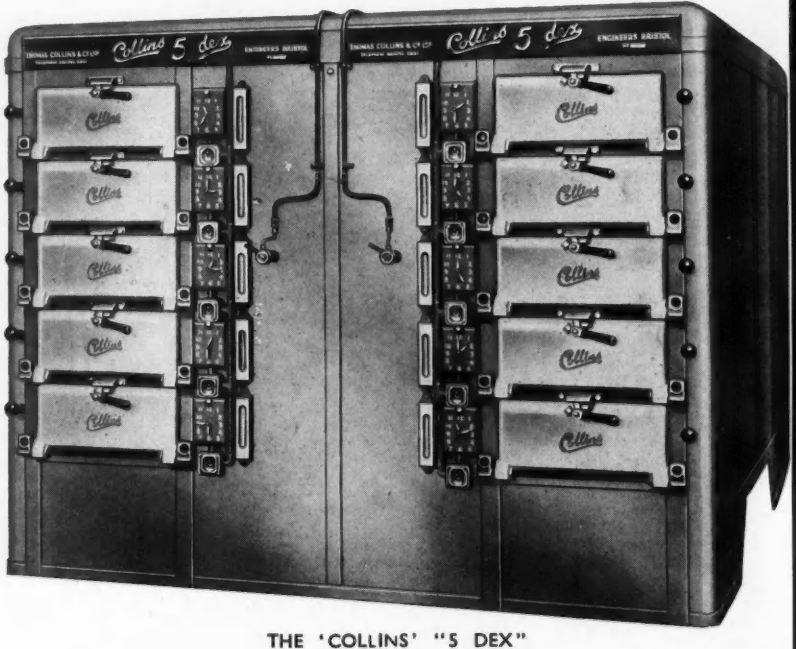

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Testing and Research at Birmingham

Inauguration of Laboratories at Nechells

ON Saturday, September 2. Sir Harold Hartley, K.C.V.O., F.R.S., President of the British Association for the Advancement of Science, officially opened the Central and Research Laboratories at the Nechells gasworks, Birmingham, of the West Midlands Gas Board. The laboratories, described here, are the outcome of continuous development since 1892, when Dr. H. G. Colman was appointed by the Birmingham Gas Department to take charge of chemical testing and to combine his work with research. The story of this development is of the greatest interest and the results achieved constitute an example of the success of continuity of purpose over the years. In the laboratories, now combined and completed, well equipped not only for intricate analytical work but for thorough-going research, the West Midlands Gas Board has inherited a most valuable asset.

Our photographs show (top) the external aspect of the new laboratories at Nechells; (bottom left) the library; (right) the analytical problem laboratory.

Dr. Colman occupied the post to which we have referred for 10 years, from 1892 till 1902, when he went into private consulting practice. In 1903 the Engineer-in-Charge, Mr. Henry Hack (appointed in 1902 on the retirement of Mr. Charles Hunt) advocated the building of a 20-ton plant for the testing of coals for carbonising purposes. The plant, ready for operation in 1905, consisted of four beds of hand-charged horizontal through-retorts with condensing, scrubbing, purifying, and metering plant, plus a 240,000 cu.ft. gasholder and every measuring facility for obtaining the data necessary for testing. Dr. W. B. Davidson was appointed to take charge and soon after taking up his duties he found that the laboratory at Saltley was inadequate for the increased work. He recommended a scheme for reorganising the chemical and testing work round a proposed Central Laboratory close to the Coal Test works, and this was accepted by the Committee.

In 1912, Dr. Davidson was made Engineer of Nechells works, and Mr. E. W. Smith (later Dr.), was appointed to combine the job of chief chemist with his existing work on the development of the use of high pressure gas, on which he had been engaged during the previous two years. In 1915, he asked for this latter work to be severed and run as a separate entity. The increased chemical work required by the Department called for more laboratory space, and an extension was built in 1914. Chemical work under Dr. Smith was in great demand during the first world war, but difficulties in the way of building laboratory extensions were insurmountable. In 1920, Dr. E. W. Smith (now Sir Ernest), left to join the Woodall Duckham Company and Mr. T. F. E. Rhead, Senior Assistant since 1915, was appointed Chief Chemist. During his regime, the increasing appreciation of the value of chemistry, together with the steady growth of the undertaking, called for considerable increase in laboratory space, but owing to the financial stringency of the times, this had to be met by adding temporary buildings.

In 1938 the Gas Committee authorised the engagement of Messrs. J. Alfred Harper and Son to collaborate with the Chief Chemist and design a suitable extension. The scheme was devised and accepted by the Gas Committee in 1939, and resulted in the present building, which was erected by Messrs. Maddocks and Walford, Ltd., in 1939-40, but only fitted, furnished, and equipped in 1949-50, which work has just been completed.

The new building, together with the renovated and re-equipped old building and various arches, comprises the central and research laboratories. These laboratories benefit greatly by being able to call on the resources of the central test works as regards workshops, personnel, and ground space, and also by having the central test works on which to carry out large scale experiments.

The New Building

The new building is a four-storeyed structure in red brick encasing a steel skeleton, which is designed to carry two more storeys when required. A semi-circular mullioned window rises from the central porchway to the stone parapet and gives a pleasing and distinctive character to the whole edifice. Externally the building is 80 ft. long, 50 ft. wide and 62 ft. high.

A central corridor scheme with rooms branching towards the windows on either side was adopted. The floors are designed for a load of 300 lb./sq. ft. and comprise 6 in. of reinforced concrete covered with 5 in. hollow tiles to act as heat and sound insulators, and to allow insertion of troughs if required at any time. These tiles are screeded with cement and covered with Burmese teak blocks. Each floor beam is supported by two intermediate pillars placed approximately one-third along the beam from each end. The steel skeleton is so designed that each floor can be divided

into 12 units. Ten of these can be partitioned off into laboratories of one or more units as desired.

Heating System

Steam-heated hot water radiators are used for heating. Air sufficient for three to five changes per hour is drawn down an intake shaft from roof level through Vokes filters by Sirocco type fan and delivered into two vertical shafts one on each side of the corridors. From these it passes into horizontal ducts at ceiling height, one on either side of the service duct above the corridor, and is delivered to the various laboratory units through grilles. The spent air finds its way out through exits under the radiators, these exits being covered with oiled silk flaps to stop back draught from wind. In severe weather, a limited amount of heat can be imparted to this air via a hot water gilled heater on the outlet of the fan.

Glazed earthenware ducts 9 in. diameter run from roof level almost to ground level in the walls on either side the main stanchions. Blanked tees are inserted in each laboratory unit to which fume cupboards can be connected. Fume cupboards are provided with top and bottom outlets, and an air current is maintained at a velocity of 50 ft. per min. The equipment usually consists of gas-heated hotplate, thermostatic electrically-heated hot water bath with drip feed and with the top flush with base of cupboard, and one extra gas and water point, all with external controls. Copper wastes run to nearby dilution pots and everything is extremely accessible.

Drains and Ducts

Floor drains and ducts are completely eliminated by placing sinks and dilution pots on boundary walls and passing wastes through walls to balcony troughs, thence to vitreous enamelled down pipes. Benches are provided with lead lined troughs which deliver to the nearby sink dilution pots.

Gas, water, and compressed air services are in copper, and electric cables are encased in standard conduit. Additional services can readily be installed. A great deal of time and thought was given to co-ordinating the electrical, plumbing, and gasfitting arrangements in order to give a tolerable pattern to the finished scheme, which was adopted to give maximum accessibility, flexibility, and readiness of inspection.

Double windows in offices and library, exhaust fans on roof fixed on rubber cushions, canvas connections between fan and ducts, double floors, etc., reduce noise.

The laboratories are well supplied with equipment not only for the more difficult analytical and problem work, but for thorough-going research work. It may be of interest to list some of the more special pieces of equipment, *e.g.*, Raymax X-ray crystallographic apparatus, high tension laboratory scale electro detarrer, Cossor 2-beam oscillograph, 300 W. di-electric heater, micro, aperiodic, and chainomatic balances, Cooke Troughton and Sims polarising microscope with photographic attachment, binocular microscope, dark room enlarging and copying equipment and stainless steel sinks, Spekker photo-electric absorptiometer, photo cell densimeter, air velometer, electrometric titration apparatus, Baragyro centrifuge, G.L.C. and Towers high efficiency fractionating columns, E.E.L. portable photometer, Unicam spectrophotometer, pH meters, mercury diffusion pump, Edwards high vacuum pumps, pyrometers, thread recorders, thermopiles, Evans modified Bone and Wheeler, infra-red, CO, and Cambridge CO_2 recorders, six-point potentiometer recorders, Muldivo calculating machine.

The library has a nucleus of excellent books on subjects concerning chemistry, physics, chemical and gas engineering, etc., and an important range of technical and scientific journals. An Intelligence Section is being developed.

Aspects of the Work

The juxtaposition of laboratories and the large scale test works affords unique facilities and opportunities for translating laboratory results into semi-scale work and, later, full scale work. This was a compelling argument for extending the laboratories on the present site.

When the extension was undertaken, it was fully expected that it would be finished in 1940, and that a strong team of research workers would then gradually be recruited. Unfortunately, through the exigencies of war, this scheme has been delayed for 10 years.

It was felt that there was a lot to be said for developing a research section in close contact with gasworks day-to-day practice and problems, providing it did not preclude a reasonable modicum of long distance scientific research. A little of this latter more academic work, say 20%, encourages high standards of scientific thought and execution, and keeps the whole staff on its toes. Moreover it forms a bridge with the cognate research Associations such as the Gas Research Board and the British Ceramic Research Association, and between the University research departments and the industry.

Lack of Information

Prior to nationalisation, wartime experience had shown that many of the undertakings in the area were badly off for scientific information, and one of the efforts of the central laboratories is being directed to redress this and to disseminating information to the area. These efforts have been greatly facilitated by the completion of the new laboratories.

The present annual coal consumption for the area is approximately 3,300,000 tons. It is important to make frequent tests of gas-making characteristics, etc., and this is done by carbonising 30 lb. charges in a retort of heat-resisting alloy (Ni-Cr. 'Cronite'). This method gives results in a day or so. For many coals, the results on this plant have been co-ordinated with practice. With a new coal, however (*e.g.*, one from another seam, or of a different size) it is often necessary to test on the large scale continuous vertical plant over a period of five days, which becomes about six-seven days when allowance is made for tuning up and contingencies—*i.e.*, about 50 tons of coal are required. The plant not only gives gas coke, tar, and liquor yields, but allows judgment, of (1) the coal's mechanical behaviour in retort and on the extractor, (2) the nature of coke produced and the percentage of breeze below ¼ in., and (3) the steaming properties of the coke.

Considerable investigation work is being carried out on such matters as how to increase coke reactivity economically to enable larger pieces to be burned in domestic grates and how to increase density without reducing reactivity, so as to reduce the trouble of making up domestic fires so frequently.

During the war, specially reactive cokes were made on the central test works (1 ton per hour plant) for the Ministry of Transport for portable producers. This pilot work was in collaboration with the Fuel Research Station and the British Coal Utilisation Research Association.

Refractory Materials

Consignments of refractory materials are sampled and subjected to furnace tests and other physical tests. This fascinating and important branch of physical chemistry calls for continuous investigation work. Considerable research has been initiated by the department and carried out, often in collaboration with the British Ceramic Research Association. Work is also being carried out on the devising of speedier methods of testing, for which the laboratories are well suited as regards microscopy and the like.

In regard to oxide purification research is in hand in collaboration with the Gas Research Board to find means of reducing gumming matter and consequent back pressure trouble. This latter trouble appears to have increased with the introduction of electro detarrers, whereas it was expected these detarrers would eliminate back pressure. Much work, too, has been done in conjunction with the National Benzole Association on the quality of benzoles.

Liquor Disposal

The new laboratories are well equipped to help the area in the problem of ammoniacal liquor and effluents disposal, and a large amount of useful work is being done for the Liquor Effluents Committee of the West Midlands Gas Board.

Work in connection with the usage of gas and coke forms an important branch of the work of the laboratories, which have been specially equipped for testing new designs of coke and gas using appliances, and for dealing with district complaints. Actual cooking tests and tests on wash boilers, etc., are carried out by the staff of the Home Service Adviser to the board.

Sampling of coal and coke presents any laboratory with a big problem if it is to conform to the requirements of statistical mathematics. Much work has been performed by the laboratories along with other industrial laboratories for the B.S.I. Sampling Committees to devise satisfactory sampling specifications.

A laboratory electro-detarrer working at approximately 20,000 v has been built and experiments are about to commence on this problem, and on the still more

(*Continued on p. 505*)

North Western Gas Price Structure

The North Western Gas Board is not likely to introduce any changes in the price of gas before the new year, Colonel W. Moncrieff Carr, C.B.E., T.D., Chairman of the board, told members of the North Western Gas Consultative Council at a meeting in Manchester on September 14.

At the year end, he said, it is hoped to introduce a new comprehensive price structure which will: (1) Equalise as far as is practicable gas charges within each of the board's 17 groups which have been established as operational accounting units in place of the 103 undertakings taken over at vesting date; (2) offer consumers where they do not already enjoy it an alternative two-part tariff consisting of a fixed charge to cover overhead costs and a low commodity charge; and (3) bring prices into step with increased costs of labour, coal, transport and materials generally which have all risen since vesting date.

Economies effected through the board's reorganisation measures would offset to a certain extent increased costs, Colonel Carr explained, and he pointed to the example of the Manchester undertaking which without increasing gas charges had in the first 11 months under nationalisation converted a small deficit into a surplus.

As a result of the price levelling planned within the group areas consumers supplied by the smaller undertakings were expected to benefit relatively. The introduction of the two-part tariff would directly benefit domestic consumers who made the fullest use of gas by giving them additional supplies at prices lower than was possible with a flat rate charge.

Careful surveys are at present being made and are expected to be complete shortly. In devising the new structure, Colonel Carr stated, account would be taken of the record of the undertakings in respect of plant maintenance in the period leading up to nationalisation. Where maintenance had fallen into arrears and now had to be made good out of revenue, it was obvious that the additional outlay must be covered by the price of gas charged in that particular group."

After Colonel Carr had explained the proposals, Councillor C. E. P. Stott, Chairman of the council, said he felt the council should place on record their profound regret that on the ground of ill-health Colonel Carr was withdrawing from his onerous position as Chairman of the board. The motion was seconded by Councillor W. Smith (Burnley) and carried unanimously, and Colonel Carr suitably responded.

Subsequent to the meeting the members of the council inspected the technical headquarters of the North Western Gas Board at the Bradford Road Gasworks, Manchester.

They were shown by means of charts, diagrams and plans, with coloured symbols, work in regard to extension of plant and the distribution system. The work already completed, in progress, or projected, was fully explained. The members were impressed by the magnitude of the work which had been accomplished in a relatively short period of time.

There was an expression of satisfaction that the activities of the area were proceeding on such a solid foundation.

NECHELLS LABORATORIES —
Continued from p. 504

fascinating problem of determining the effect of the discharge on gas constituents.

The laboratory is entirely responsible for advising on all instruments used on the works and for keeping them well maintained and correctly reading. Workshops and laboratories have been fitted for repair and calibration work, and standard test apparatus (N.P.L. checked) is kept for this purpose. Special instruments and mechanical gadgets are made as required, and close contact is kept with instrument makers.

Account of the work of the laboratories would be incomplete without mention of the considerable activities by the chemical staff in the education of gas industry students. Regularly also, about 1,500 pupils from the Birmingham schools visit the laboratories and see the model gasworks demonstrated before proceeding round the works.

Better Use of Fuel

Four hundred members and delegates will meet at Margate on Sept. 27 for the 'Coming of Age' conference of the National Smoke Abatement Society. The conference will be marked by the presentation of the first Des Voeux Memorial Lecture, read in honour of the Society's first President, Dr. H. A. Des Voeux, who helped to found one of its two parent bodies in London in 1899. The lectures are intended to relate smoke abatement to subjects of wider national interest. The first, 'Towards the Better Use of Coal,' is to be by Dr. D. T. A. Townend, formerly Professor of Fuel Technology at Leeds University and now Director-General of the British Coal Utilisation Research Association.

Two papers on the relation of smoke to respiratory disease will be read, one by Dr. J. S. G. Burnett, Medical Officer of Health for Preston, and the other by R. E. Waller, of the Department of Pathology, St. Bartholomew's Hospital. Dr. Burnett will discuss the increased mortality during smoke fogs, both in this country and in the disastrous cases that have occurred in Belgium and the United States. Mr. Waller is to give an account of experimental work in progress relating to the excess of cancer of the lung in towns as compared with country areas, and to the presence in town air of a cancer-producing substance, benzpyrene, of which the domestic coal fire is most likely to be the source.

At another session the question of preventing smoke in new housing, by using modern methods and smokeless fuels, will be discussed in a series of short papers, including one on the new towns and one on the first plans for including housing areas in smokeless zones, where all smoke will be prohibited. Finally, the problem of railway smoke will be surveyed in two papers, in one of which an officer of British Railways will describe how they are attacking it.

Women's Gas Council.—At the invitation of the officers of three branches in the north, Miss D. W. Pidsley, of the Women's Gas Council headquarters, recently visited Halifax, Harrogate, and Bradford to speak on the Council's activities in London. The aim at headquarters is to address as many branches as possible in the year and members of the staff give lectures and talks on various subjects of interest to women. Branch members visiting London at any time are welcome to headquarters at Gas Industry House.

Irish Gas Association

During the course of the annual meeting of the Irish Gas Association at Limerick on September 5, under the Presidency of Mr. F. K. Thomas, Limerick City Gas Engineer, the following office-bearers were elected for the ensuing session :—

President: N. J. Robertson, General Manager, Alliance and Dublin Consumers' Gas Company.

Senior Vice-President: G. Walmsley, Managing Director, Engineer, and Secretary, Londonderry Gaslight Company.

Junior Vice-President: H. W. Saville, Managing Director and Secretary, Wexford Gas Consumers Company, Ltd.

Committee: C. W. Surman (Ballymena), T. F. Broderick (Enniscorthy).

Belfast Price Increase

At a special meeting of the Belfast Corporation Gas Committee on September 15 it was reported that additional costs outside the control of the gas industry would entail an increase of £123,000 per annum in the direct costs of the Belfast Gas Department.

To meet the additional burden the committee recommended an increase of 4½d. per 1,000 cu.ft. in the price of gas to ordinary consumers (5d. gross, less 10% for payment within one month), with comparable increases for prepayment consumers.

Industrial consumers, except those taking more than 2 mill. cu.ft., will pay an extra 2½d. per 1,000 cu.ft.

Proposed Stockton Holder.—When the plans of the Northern Gas Board to erect a gasholder near Portrack Lane, Stockton, were further considered at a meeting of Stockton Town Council, it was reported that the Ministry of Town and Country Planning was in touch with the Ministry of Fuel and Power on the matter. When an alternative site for the holder was suggested to the board recently, it was turned down on the ground that considerable piling work on the site would be needed. The Borough Engineer (Mr. Gilbert Cowan) has examined the site selected by the board near Portrack Lane and has expressed the view that piling to a depth of 10 ft. to 12 ft. will be needed on this site also. The Council is opposing this site because a school is to be built nearby.

COAL QUALITY AND GAS MANUFACTURE*

Experience of North Thames Gas Board

By J. BURNS, G.M., B.Sc., Ph.D., F.Inst.F., M.Inst.Gas E.,
Chief Engineer, North Thames Gas Board

IT is a generally accepted fact that the quality of coal supplied for most industrial purposes at the present time is inferior to that supplied prior to World War II.

In the electricity supply industry, and in other industries requiring coal for direct combustion, the value of the coal as a fuel can be fairly accurately assessed by the simple determination of its calorific value, and although other properties, such as the ignition characteristics, coking properties, and ash fusion temperatures, &c., may be of some significance in relation to particular types and designs of boilers, they have a negligible effect upon the heat released by combustion.

In the gas industry, however, the determination of the value of a coal for gas-making purposes is a more complex matter. It is known that the volatile content may prove to be a very misleading indicator of actual gaseous thermal yields, while the results obtained from assay tests may differ appreciably from those obtained with full-scale plant. The inert content of any particular coal has a direct bearing on the gas yield which can be obtained from it, and a study of proximate analyses and assay test results from various coals can provide a useful preliminary indicator of changes in coal quality.

The quantitative interpretation of such results should be considered with some reserve.

Results of Analysis

In the works of the North Thames Gas Board, coals are received from two main sources, namely, the Durham area, and the Yorkshire and Midland areas. Weighted averages of the analyses of these two groups of coals have been determined, and the results for the manufacturing stations of the former Gas Light and Coke Company covering the post-war years in comparison with those for 1938 are given in Table I.

TABLE I.—*Proximate analysis of coal carbonised (as received).*

Year	Volatile matter, %	Fixed carbon, %	Ash, %	Moisture, %	Total inerts, %	Assay tests Therms per ton	Assay tests Coke and breeze, cwt.
Durham coal :							
1938 ...	31.8	59.7	6.1	2.4	8.5	73.3	13.6
1946 ...	32.2	58.2	8.1	2.5	10.6	—	—
1947 ...	31.8	57.7	7.7	2.8	10.5	—	—
1948 ...	31.9	57.5	7.8	2.8	10.6	70.0	13.8
1949 (first four months)	31.8	57.5	7.8	2.9	10.7	69.9	13.8
Yorkshire coal :							
1938 ...	34.3	58.5	3.8	3.4	7.2	76.9	13.0
1946 ...	32.9	56.1	6.5	4.5	11.0	—	—
1947 ...	33.6	57.5	5.2	3.7	8.9	—	—
1948 ...	32 9	57.4	5.3	4.5	9.8	71.6	12.8
1949 (first four months)	32.6	56.9	5.2	5.3	10.5	69.3	12.7

The analyses set out in Table 1 represent the weighted average of approximately 9,000 different tests on samples representative of 13 mill. tons of coal. It is evident from this table that the total inert material in the Durham coals is over 2% higher in the post-war years than in 1938, while the difference is rather greater in the case of the Yorkshire and Midland coals, which are shown to include 3% more inerts during the last 18 months. It is also of interest to note that the latter coals have continued to decline in quality during the post-war years, while the Durham coals have remained fairly stable.

When comparing the assay test results, it is interesting to note that the post-war Durham coals give a 4½% reduction of gaseous thermal yields over those obtained from the pre-war coals. This is more than would have been expected from the 2% rise in inert content. Further, the Yorkshire coals show a reduction in thermal yields of about 7% over the same period, which is more than double that which would be expected from the increase in inert content. Such figures serve to show the limitations of the proximate analyses as final criteria of the value of coal for gas making.

In the Gas Light and Coke Company an attempt was made to assess the influence of reduced coal quality following the Second World War, by a careful comparison and study of the actual carbonising results obtained from various plants, and therefrom to weigh up the influences of the various contributory factors by a process of elimination. Such a method can make no claim to highly scientific accuracy but, like many other problems, confidence is lent to the conclusions by the weight of evidence from extensive data and the logical interpretation of the results by those experienced in carbonising technique.

Other Influences

It is apparent that factors other than coal quality are likely to affect the carbonising results. These may be classified under the following headings:—

(1) Deterioration in the performance of retort house installations due to age.
(2) Changes in design of retort houses.
(3) Quality of labour and supervision.

It is interesting to consider these factors in the light of the results obtained in a very large undertaking like the Gas Light and Coke Company, carbonising approximately 3,500,000 tons of coal per annum, and comparative results show that whereas the thermal yield per ton, measured at 500 B.Th.U./cu.ft., was 81.9 in 1938, this yield had deteriorated in post-war years to the values shown in Table II.

TABLE II.—*Yield of coal gas portion of coal.*

Year	Therms
1938 ...	81.9
1946 ...	75.1
1947 ...	76.2
1948 ...	77.6
1949 (first four months)	78.7

It is considered that by 1948 the condition of retort house installations throughout the company, and the quality of supervision and labour in the retort houses, were equivalent to that obtaining in the company in pre-war years, and the above results indicate that the poorer quality coal accounts for the deterioration of some 4 therms/ton, measured at 500 B.Th.U./cu.ft. It would appear from this result that the loss in heat is not directly proportional to the increased ash and moisture content, since if this were the case, a loss of only 2 therms/ton would be expected.

Extra Loss of Heat

In seeking to explain this extra loss of heat, the following factors may be found to exert an influence:—

(*a*) The above coal analyses are representative of the coal as received at the works, but consequent upon the policy which has now been adopted for buying coal, considerable quantities of coal are put into storage in the summer time and reclaimed in the winter time, whereas prior to World War II the rate of coal intake into the works bore a closer relation to the coal usage at any time. This means that more coal is stocked, with a consequent greater deterioration due to oxidation when exposed on the stock pile.

(*b*) It is probable that the increased ash content of the coal may have an indirect effect on the carbonising process due to the increased ash content of the coke fed to the producers. The higher the ash content of the coke the

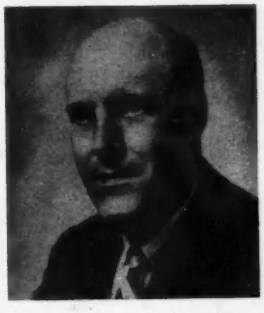
Continued on p. 514.

* From Paper No. 4, Section D2, Fourth World Power Conference, London, 1950.

FIFTY YEARS OF PUBLIC LIGHTING*

By P. RICHBELL, M.Inst.Gas E.,

Distributing Engineer, East Surrey Division, South Eastern Gas Board.



I REGARD my election as President of the Association of Public Lighting Engineers, apart from the personal one, as a compliment to the gas industry, in which I have been engaged for the past 43 years, the last 25 years of which have been actively associated with the development of public lighting, both from scientific and administrative aspects, and attained my majority as a member of the Association last year. I have watched the rapid growth of the Association, and have been keenly interested in its various activities.

Last year your Council presented revised articles of association and by-laws for your consideration. They were approved, subject to several amendments which required the ratification of the Board of Trade. These amendments were subsequently accepted by that body, and the revised articles and by-laws were confirmed at an extraordinary general meeting of the Association held in December.

Group Membership

In his address at the last conference, the President expressed the view that the Association had reached a decisive stage in its career, brought about mainly by the transfer of the gas and electricity industries to public ownership. It is, therefore, interesting to note that, of the three most outstanding points in the revised articles of association and by-laws, the foremost is the formation of a new class of group membership, which provides for the representation of nationalised and other bodies by corporate members whose admission is approved in the normal way by the council of the Association. This class of membership meets the needs of the Gas Council and British Electricity Authority, who have promised full co-operation and have requested each area board to consider the desirability of becoming a group member of the Association.

Technically qualified representatives of firms supplying public lighting equipment are now eligible for corporate membership of the Association. This amendment will considerably strengthen the composition of the Association, and I feel sure you will agree that, if only for the valuable help they have given in staging exhibitions and the presentation of papers, this privilege is long overdue.

Apart from the nationalised bodies, considerable changes are taking place in the municipal world and it is felt that there must be a considerable number of officials of local authorities eligible for membership who, by becoming members, could contribute towards the interests of the Association.

Under the old articles of association and by-laws, only the senior executives of undertakings and municipal authorities could be members, whereas the new by-laws contain no limitations in this respect. Under these conditions, any member of the staff of a public lighting department, provided he has the necessary technical qualifications, can be a corporate member.

The council has made enquiries from time to time from the Board of Trade with regard to the raising of the status of the Association to Institution level. It is felt, however, that approval of this proposal will not be granted until the membership of the Association has considerably increased, and admission by examination becomes compulsory.

The membership has increased rapidly in recent years and with the co-operation promised by the two nationalised industries, coupled with an additional interest from municipal authorities, the position will be much improved in the course of the next few years. In this connection, members and delegates will be aware that the Association has local centres in Scotland and Lancashire, whose activities are helpful to members.

If further centres could be inaugurated in other parts of the country, they would be conducive to a widening of the activities of the Association. The council would be glad to hear from any members who would be prepared to act as founders of such new centres.

The question of the preparation of a syllabus for a course in the theory, practice, and administration of public lighting is a much more difficult one, and has engaged the attention of the council for some years. Unfortunately consideration of this matter had to be deferred during the war for obvious reasons, but it has engaged attention during the past year, and a sub-committee has been formed to carry out further investigations. There are a large number of problems to be considered in this connection, but it is hoped to arrive at satisfactory conclusions in the near future.

Apart from the annual conference, which those who have attended regularly will know has grown from strength to strength, the Association operates in conjunction with a number of other bodies who have interests in the science of public lighting.

The first of these is the Ministry of Transport, which in 1946 was established as the central authority for street lighting. Since that date we have collaborated on various matters, particularly on the general improvement in the standard of lighting.

It is felt, however, that this standard is far from sufficient to meet the needs of present-day traffic conditions, quite apart from the big increase in vandalism at the present time. It is considered that the number of accidents on the roads could be appreciably reduced, and the movement of the public during hours of darkness made much safer if the standard of lighting was still further improved.

Cinderella of Public Service

Public lighting has for many years been treated as the Cinderella of public services when local authorities are preparing their annual estimates of expenditure. Under the Trunks Roads Act, the Ministry of Transport was authorised to make grants towards the cost of installation and maintenance of new Class A road schemes. These schemes can, however, only be considered by the larger authorities, for small local authorities could not support the proportion of the cost to be borne by them, which would add considerably to their rates, quite apart from the fact that this lighting is largely being provided for through traffic. I feel very strongly, however, that the M.O.T. being now the central authority for street lighting, a percentage of receipts obtained from motor licences should be transferred to a public lighting fund. If a scheme could be inaugurated on these lines, it would be conducive to obtaining a uniformity of lighting on Class A roads, and a general improvement in the standard of lighting in Class B roads.

There is a further subject on which collaboration has taken place with representatives of the Ministry of Transport, and that is in connection with the design of public lighting equipment. When the Ministry agreed to make a grant towards installation costs of Group A installations on trunk roads, it was stipulated that designs of street lighting columns should be approved by the Royal Fine Art Commission. Members will no doubt agree that this was a commendable action on the part of the Ministry, as they are desirous of improving the æsthetic aspect of the column equipment erected on highways for which the Ministry is directly responsible.

As a result of this stipulation by the Ministry, it appears that there is an erroneous impression by some local authorities that all lighting equipment, with particular reference to Class B lighting, must be approved by the Royal Fine Art Commission.

* From Presidential Address to the Association of Public Lighting Engineers, Bournemouth, September 18, 1950.

The representative of the Ministry has authorised me to state that he felt sure all members of the Association would be in strong sympathy with the general aim of the Commission to improve the appearance of lighting equipment, but, having regard to the present economic circumstances, the Ministry would be favourably inclined towards improved installations which make use of existing materials, provided always that the resulting lighting scheme was satisfactory.

Monstrosities

I would, however, call attention to the large number of monstrosities which one can see when travelling through the country, which are used as public lighting equipment. I would ask all concerned to take every opportunity of removing them, as this alone would considerably improve the æsthetic appearance of our highways.

The Association is a co-operating member of the British Standards Institution, and has the right of representation on the Illumination Committee. The Institutions of Gas and Electrical Engineers are also sponsoring members of the Institution, each body being represented by three of its members. The Associations representing the manufacturers of gas and electrical fittings also have representatives on this committee. Several of the representatives of these bodies are members of this Association.

The majority of the older members of the Association will remember the introduction of the British Standards Institution specification in 1927, standardising various grades of lighting to be used in conjunction with the illumination of our streets, and the tests carried out in connection therewith, which were a very big advance in the standardisation of public lighting.

This specification was used as a standard during the next few years, but owing to the changes in the design of lighting fittings, and other investigations in illumination, the Ministry of Transport set up a Departmental Committee on Street Lighting, and an interim report was issued in 1935, followed by a final report in 1937. This report was only in the form of a recommendation, and owing to the intervention of the war it had to be shelved until after the cessation of hostilities. Since the war, the recommendations contained in the report have been subject to much criticism, and it was decided to issue a Code of Practice in lieu of a specification. Members will be aware that this has now been issued by the B.S.I. for comments. Members who attended the conference of this Association in Glasgow in 1946 will remember the valuable contribution, in the form of an address given by Dr. J. W. T. Walsh, Director of the National Physical Laboratory, on the Final Report.

The Age of the Flat Flame

There was considerable discussion during the early part of the year as to whether the half-century ended last or next December. However, as this is September, I can only be a little wrong either way. It is perhaps difficult to realise that at the beginning of that period paraffin and flat flame gas burner lamps were the only commercial forms of artificial illumination in use for lighting our streets. It was about 30 years later that one of the first electric lighting schemes of appreciable magnitude was carried out on the Thames Embankment, between Westminster and Waterloo Bridges. This experiment consisted of 20 Jablochkoff carbon lamps, which were erected over a distance of 1,170 yds. Each lamp consisted of four Jablochkoff candles and each candle lasted 1½ hours, so that six hours continuous lighting was assured. To reduce the intrinsic brilliancy from the light source the lamps were enclosed in 20 in. diameter opalescent globes.

While these experiments were being carried out in electric lighting, Dr. Auer von Welsbach was carrying out experiments with the gas mantle. The first public demonstration of this system was made in February, 1887, when it was acclaimed as a very great advance in the efficiency of gas lighting, and it has remained the basis of illumination by gas until this day. At that time many fears were expressed as to the commercial possibilities of this invention, but with the alterations in design of burners and methods employed in mantle manufacture, it is a highly satisfactory commercial article today. The mantle was first constructed in an upright form, but about 1900 the inverted mantle was introduced.

During the closing years of the last century, Sir Joseph Swann produced the carbon filament lamps in a practical form. The lamp consisted of a filament made by carbonising a cellulose fibre similar to artificial silk, mounted in a glass bulb which was subsequently exhausted of air.

High Pressure Lighting

The next notable improvement in gas lighting was the introduction of high pressure lighting which was achieved by consuming the gas at pressures from 65-85 in. water column. By this time mantles sufficiently strong to be used under these conditions could be manufactured, and it was possible to use much larger mantles so that each one was capable of giving a luminous output of 1,500 candles. This system is used for lighting Whitehall and a number of other principal streets of London at the present time.

About 1930 the mercury arc and the sodium lamps were placed on the market, and these are, of course, recognised by their violet and golden yellow light respectively. These lamps give a considerable increase in illumination without increasing the current consumption. When these lamps were first used for public lighting adverse comments were made, particularly by the female sex, owing to the mono-chromatic nature of the light source.

In parallel with these developments in light sources another aspect of public lighting—the correct use of the light produced—has occupied the attention of public lighting engineers, in conjunction with the manufacturers of street lighting equipment, in the last quarter of the period under review.

The first efforts in this direction were carried out by the addition of refractors or reflectors to more or less existing lanterns, and this process of controlling the light output and the particular aim of producing the highest visibility on the highway has now reached the point at which waste of light in the upper directions has been reduced almost to the minimum possible, at the same time giving a much more even lighting effect.

In the various stages of this latter development some of the fittings produced were not, by any means, free from severe glare effect, and some of the installations erected on our highways have been rightly criticised on this score.

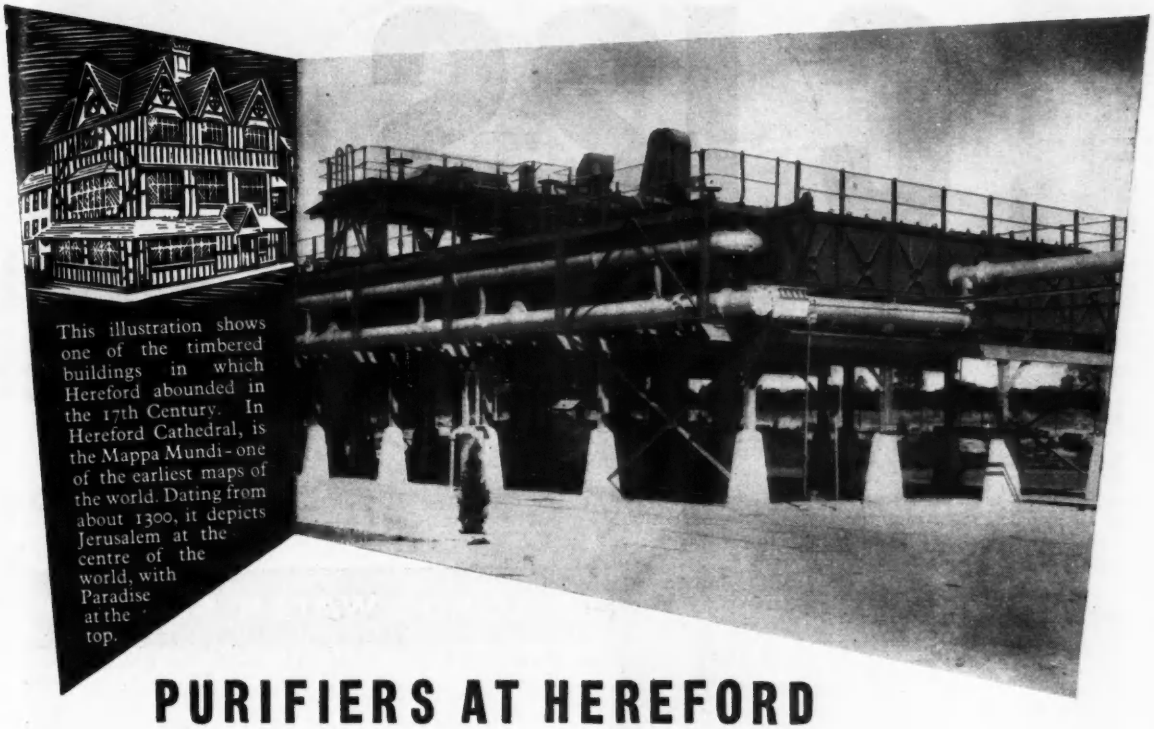
The present trend appears to be towards the use of sources of comparatively low intrinsic brightness, with carefully controlled distribution avoiding excessive intensity near the horizontal, a form of distribution readily obtained from horizontal linear sources which also give the wide fanshaped spread of light which is considered very desirable.

Lantern Development

This process of lantern development has been coupled with intensive studies of the properties of specialised glassware and plastics, and has resulted in the production of lanterns which are not only technically sound, but are cheap to maintain, and incidentally have a very attractive day and night appearance, which is a point of considerable importance.

Change of colours in different sections of roadway, due to the light source employed, has a tendency to be disconcerting to drivers of vehicles when passing through various types of lighting. In the early days of the war the fluorescent lamp was produced in a marketable form, and having been rapidly improved during the last few years, has now been adopted for use as a public lighting unit. This type of lamp has reduced current consumption and provided the nearest equivalent light to daylight which has yet been produced by the electricity industry.

Although the Association continues to grow in membership, the rate of development could be considerably increased as the importance of street lighting is realised by those authorities responsible for this service. The council is desirous of furthering the interest in public lighting, and feels that membership of the Association is the only common ground on which problems in connection with public lighting can be fully discussed and many cases solved.



This illustration shows one of the timbered buildings in which Hereford abounded in the 17th Century. In Hereford Cathedral, is the Mappa Mundi - one of the earliest maps of the world. Dating from about 1300, it depicts Jerusalem at the centre of the world, with Paradise at the top.

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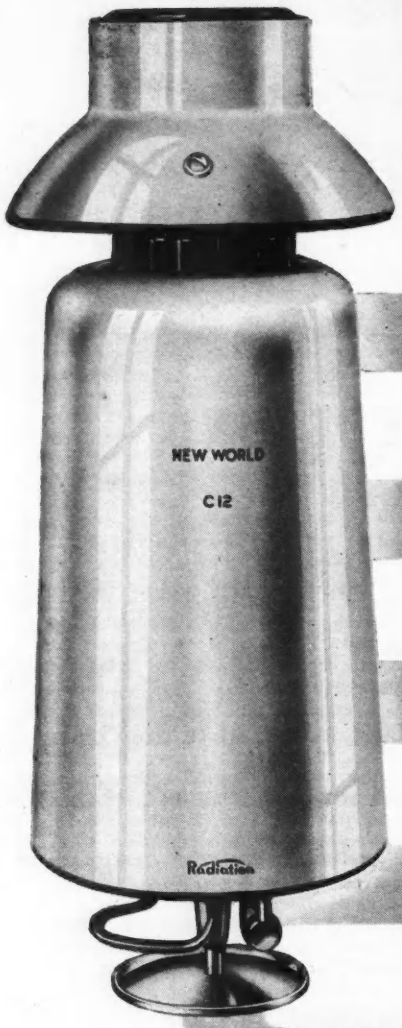

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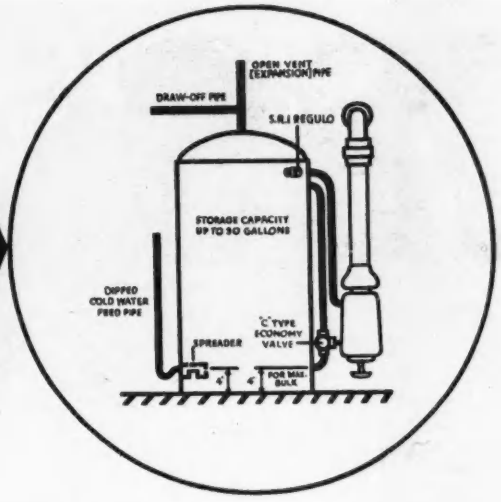

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By W. S. HALL,
George Waller & Son, Ltd.

IT was with a certain amount of reluctance that the late Mr. B. B. Waller decided in 1935 to consider a design of Roots type exhauster and compressor, and early in 1936 we produced a prototype machine incorporating the essential features of the American design but also having several novel ideas which enabled us to keep down both manufacturing costs and the overall size, while still retaining a high efficiency.

The machines now under construction are all arranged with the rotors superimposed—*i.e.*, the driven rotor is above the driving rotor and not side by side as in the American type of machine. This enables us to have the inlet and outlet branches on the sides similar to the bladed type of exhauster. This feature met with a certain amount of criticism from our competitors but we are pleased to say that, in over 14 years' working, none of their fears materialised. This has enabled us to install dozens of machines in existing sites with a minimum of alterations to existing foundations, connections, etc. In a large number of installations we have been able to fix Roots exhausters, having over 100% increase in capacity, between the existing valves by using suitable distance pieces to make up the face-to-face of the branches.

There is, in the design, practically no difference between Roots exhausters and compressors, with the exception that, when a machine is used as an exhauster, we provide two pipe connections from the base of the casing, for tar drains, and from the four connecting points at the bottom of the stuffing boxes. When machines are used as compressors, these points are normally plugged up and no connections provided.

To meet the capacity and pressure requirements of the gas industry, we have a range of machines from 1,000 to 1 mill. cu.ft./hr., covering nearly 100 different sizes. The size reference of the machine is given by its centres—*i.e.*, of the rotors and gears, measured in inches, by the length of the rotor or casing, in inches. The smallest machine has 3 in. centres, the next sizes being 4½ in. and 6 in. centres, and then by 2 in. steps up to 24 in. centres—*i.e.*, 12 designs based on the variation of centres. For any given centres we then cover an appreciable range by varying the lengths of the rotors and casing. This enables us to achieve two objects:—first, a wide range of capacities for the lower pressures, and, secondly, to use the same design for the higher pressure ranges by shortening the rotors, etc., and so reduce its output to keep the power absorbed within the maximum limit for any given centres.

The maximum length of casing for any size machine is limited to three times the centres and the minimum of approximately 0.7 of the centres, there being eight or nine different lengths of casing for each size of centres. To give an instance, in actual figures, our 10 in. centres machine is made with casing lengths up to 30 in. and, when used as an exhauster, would handle 100,000 cu.ft./hr. at pressures up to say 50 in. w.g. By shortening the length of the casing to 24 in. we reduce the output to 80,000 cu.ft./hr., but it is then suitable for a pressure of 3 lb./sq. in.

A further reduction to 20 in. long gives 66,000 cu.ft./hr. at 4 lb./sq. in., at 16½ in. long gives 55,000 cu.ft./hr. at 5 lb./sq. in., 13½ in. long gives 45,000 cu.ft./hr. at 6 lb./sq. in., 10 in long gives 35,000 cu.ft./hr. at 7 lb./sq. in., and 7 in. long gives 24,000 cu.ft./hr. at 8 lb./sq. in. So you will see that the whole of the range of machines can be used as compressors covering pressures up to 8 lb./sq. in. and capacities at this pressure up to 500,000 cu.ft./hr., or 750,000 cu.ft./hr. at 6 lb./sq. in., and 1 mill. cu.ft./hr. at 4 lb./sq. in.

When used as exhausters, with the usual maximum pressure between 40 in. and 60 in. w.g., we select from our range of machines those having the rather longer rotors in relation to the centres—*i.e.*, an exhauster set for 200,000 cu.ft./hr. would have 14 in. centres × 36 in. long rotors, whereas compressors of the same capacity for higher pressures would have 16 in. centres × 27 in. long at 5 lb./sq. in., or 20 in. centres × 20 in. long for 7 lb./sq. in., and so on.

Working Clearances and Slip

One of the most important features of the Roots machine is control, at all stages of manufacture, of the working clearances between each of the rotors and between the rotors and casing at the periphery and the end covers. The actual working clearances determine the volumetric efficiency of the machine. Excessive clearances will mean that a percentage of gas will slip back through the clearances from the outlet to the inlet side and this slip has a definite ratio to the working pressure and the specific gravity of the gas being handled. Each machine, after it has been assembled, is given a check run at very low speeds so that we can calibrate the actual amount of slip. This we usually call a 'closed-valve test'—*i.e.*, the machine is run at slow speeds with the outlet port completely blanked off and a record is made of the number of revolutions per minute necessary to raise the various pressures within its working range, the whole of the throughput slipping back through the working clearances.

To give you some idea of the effect of the clearances, the slip revolutions on the 10 in. centres machine would be approximately 34 per minute when working against 10 in. w.g., rising to 165 r.p.m. when working against a maximum pressure of 8 lb./sq. in. This value of slip revolutions for any given machine remains reasonably constant over a wide speed range, for any given working pressure, so that, in determining the throughput of the machine, we calculate the theoretical revolutions per minute, to which must be added the slip revolutions per minute to give the actual working speed.

To give an example, the slip revolutions of a 10 in. × 20 in. machine at 4 lb./sq. in. pressure, when working on town gas, is 116 r.p.m., its displacement is 2.6 cu.ft., so that with an effective number of revolutions of 384 × 2.6, gives us a throughput of 60,000 cu.ft./hr. at a working speed of 500 r.p.m. (*i.e.*, 384 + 116). An identical machine used as an exhauster at, say, 36 in. pressure difference, and for the same capacity, would have a slip r.p.m. of 66 and so its working speed would be 450 r.p.m. (*i.e.*, 384 + 66).

Prime Movers

Roots type compressors and exhausters lend themselves to all the usual forms of drive—*i.e.*, steam, electric, or internal combustion engine. The range of speeds is most suitable for direct coupling to standard high speed vertical steam engines such as Sisson, Reader, Belliss & Morcom, etc., and this type of drive, being very flexible, is ideal for speed control over a range up to 6:1 in some applications.

When driving exhausters, the usual vacuum control would be a hydraulic governor arranged to work in conjunction with a steam throttle valve on the engine, while, on the compressor sets, we utilise the outlet pressure to operate a piston type steam governor and steam throttle valve.

Next to steam-driven machines, the most popular is the electric motor drive and here again the speed makes it suitable for direct-coupled jobs, but it is usually better, from an initial cost point of view, to use a motor running at a higher speed with a vee-rope or reduction gearbox drive. We would normally recommend a vee-rope drive, where space permits, as this would give long trouble-free service and eliminate any possible noise which may be found in certain makes of gear units due to that slight torque reversal which occurs in this

* From a paper to the Western Junior Gas Association.

class of machine. In regard to the actual motors themselves, we have a choice of constant-speed or variable-speed where a range of capacity is desirable.

For automatic control of electrically-driven machines—*i.e.*, to maintain a constant vacuum in the case of exhausters, or outlet pressure in the case of compressors—the most popular form of drive is the commutator motor. This gives very good efficiency over a reasonable speed range and can be arranged to work in conjunction with a suitable pressure-operated regulator to give the above-mentioned control. Where initial cost of motor-driven exhausters is a consideration, it is possible, in some installations, to use a constant-speed motor instead of a commutator motor, and vacuum control can be obtained by means of a hydraulic gas governor working a compensating valve.

Where automatic control is not necessary, hand speed adjustment may be employed and we would normally arrange to have a pressure relief valve incorporated in the connections of the machine to prevent over-loading or to by-pass the excess gas at low demand periods.

With compressor sets working from 2 to 8 lb. pressure, it is important that by-passing should be eliminated where possible, as this is not only very wasteful in power consumption but can give trouble due to over-heating. Where by-passing is absolutely necessary, we advise that the gas should be diverted back into a low-pressure main and preferably into a holder inlet main so that the gas has ample opportunity of again cooling down before being re-circulated into the inlet of the compressor.

We have various forms of excess pressure, by-pass valves, &c., to protect the machine from excessive outlet pressures, over-drawing on inlet mains, and also protection of holders in the form of holder cut-off valves which can be mechanically or electrically operated.

On drives using combustion engines (*i.e.*, gas, diesel, or dual-fuel types) these are, of course, most suitable for constant-speed drives, although some engine-makers do provide a speed governor having a limited range of speed control usually in the order of 25% which could be arranged, if necessary, to be controlled by a suitable vacuum or pressure governor such as the Hopkinsons Carlstedt type.

DISCUSSION

Mr. **A. G. Holtam** (Distribution Engineer, Cheltenham) stated that he had been using Roots type machines for many years. He spoke about its being possible to have a bladed machine removed and replaced by a Roots machine to double the capacity, and said that he could vouch for the satisfaction of doing this, as they had done so at Cheltenham. He mentioned the slight difference being necessary in inlet and outlet ports on bladed exhausters and compressors, and wished to know if it made any difference in the case of Roots machines.

Mr. **Hall** informed him that there was no difference in the size of the inlet and outlet branches on Roots machines, but, on the old bladed type, the size of the outlet had had to be reduced. In the bladed type of compressor there would be a certain amount of compression in the machine, but, in the Roots type compressor, the actual compression takes place in the outlet main. The data he had given regarding the horse-power for compressors applied to Roots machines only and not to reciprocating compressors.

Mr. **K. G. Pemberton** (Distribution Engineer, Torquay) raised the point of the difference between Roots type and the old bladed type of machine. He knew that double the capacity could be obtained from Roots machines. He presumed that the Roots machine would have to be driven faster, and wondered what the chief advantages would be.

Mr. **Hall,** in reply, stated that Roots machines took up less space for the same output and were suitable for speeds from 300 to 800 R.P.M. The bladed type had a mechanical efficiency varied between 40% and 55%, but, on the other hand, the mechanical efficiency of the Roots was much higher, of the order of 72% to 78%, thus giving an increased capacity for the same power.

Mr. **W. A. Chard** (Gloucester) then raised the query of using plastic valve plates instead of stainless steel on reciprocating compressors. He stated that stainless steel had proved unsuitable, but that plastic had been very satisfactory at Gloucester. He wondered, however, if Messrs. George Waller had improved on them and had been able to use them for higher pressures.

Mr. **Hall** informed him that, during the war, supplies of stainless steel were giving trouble due to the American steel being different. He said that his firm had made an experimental 'Tufnol' plate which Mr. Chard had been good enough to try out at Gloucester and which had proved to be satisfactory. Since then, thousands of these had been made, and they were now experimenting with plastic valve plates with an asbestos base for higher pressures and temperatures up to 200°C.

The **President** (Mr. A. C. Rea) thanked the author for his paper.

COAL QUALITY—Continued from p. 506.

greater is the difficulty in maintaining efficient gasification in the producers, with a consequent greater difficulty in maintaining constant tmeperature conditions in the combustion chambers.

(*c*) Associated with the higher ash content there is a higher 'dirt' content, which yields less gas than the equivalent quantity of coal substance.

It is interesting to note that the deterioration shown by the results of large-scale carbonising do coincide reasonably with the deterioration indicated by the results obtained from the assay tests, which for 1948 and 1949 show a reduction in thermal yield after weighting the results according to the proportions of Durham and Yorkshire coal used, of 3.45 and 3.90 therms/ton respectively.

The importance of this deterioration in gas yield cannot be overstressed from the industry's point of view, for if it is general throughout the country, the loss must be considerable, amounting to about 100 mill. therms per annum, and involving the necessity for a considerable amount of additional labour and plant to give similar gas outputs to those obtained under pre-war conditions.

The effect of high ash content of coal has a further deleterious effect in the manufacture of water gas, where the amount of coke used for the production of blue water gas is increased considerably. This is shown in Table III, which indicates the blue water gas yields per ton of coke for the pre-war and post-war years in all the works of the former Gas Light and Coke Company.

TABLE III.—*Yield of blue water gas per ton of coke.*

Year	Therms
1938	147.7
1946	129.2
1947	132.0
1948	137.4
1949 (first four months)	136.8

As in the case of the carbonising plants, it is considered that standards of operation and the condition of the plants in 1948 were equivalent to that obtaining in 1938, so that the deterioration of thermal yields amounting to 10 therms/ton of coke may be attributed to the poorer quality of the coke. In this case it is interesting to note that the weighted increase in the ash content of the coal in 1948 was 1.65% higher than in 1938. This would give an increase in ash content in the coke of about 2.5%, whereas the reduction in thermal yields from the water gas plants is 7%.

It is therefore evident that the presence of increased proportions of ash in coke fed to water gas generators has a serious effcet upon their performance. This may in part be explained by the increased amount of carbon which will be withdrawn from the generator along with the ash.

The effect of high ash content of coke is also reflected in the performance of steam-raising plant and in the amount of fuel required to heat retort settings, although in these cases changes in design and in methods of operation in the case under review preclude the possibility of accurate assessment of the deterioration in fuel efficiency.

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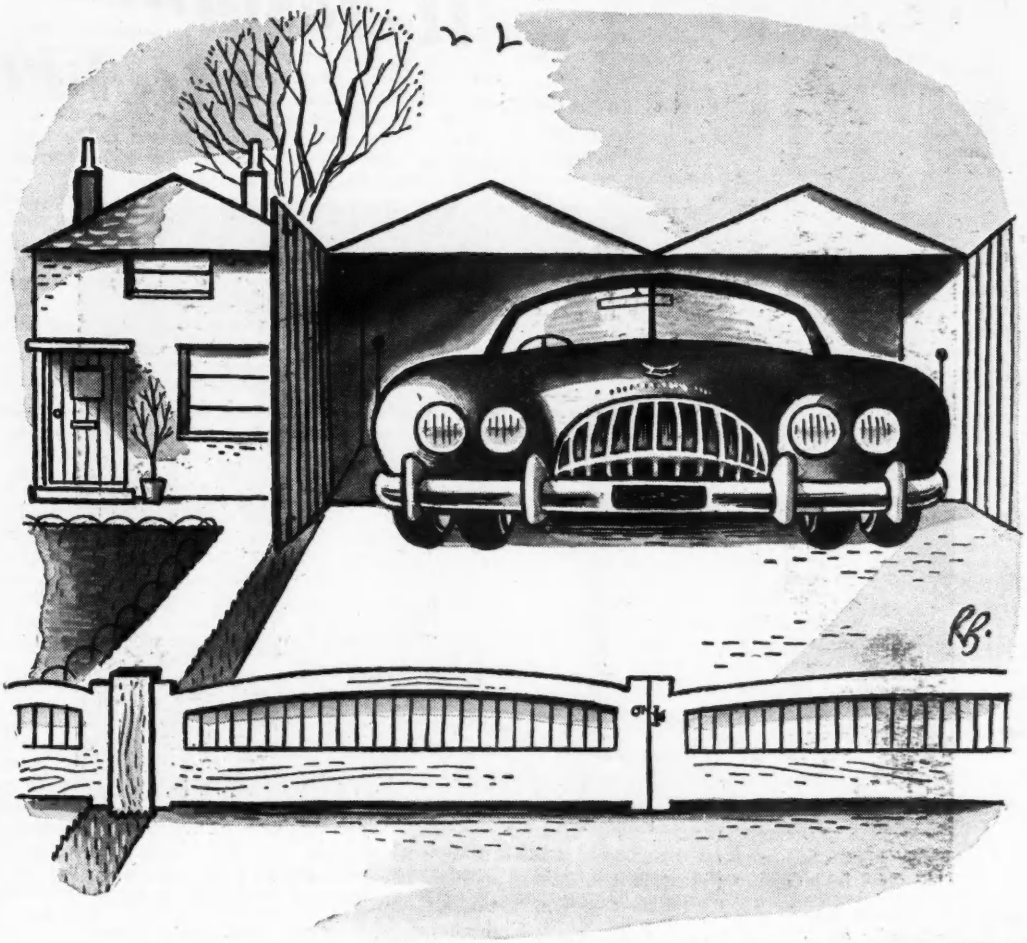

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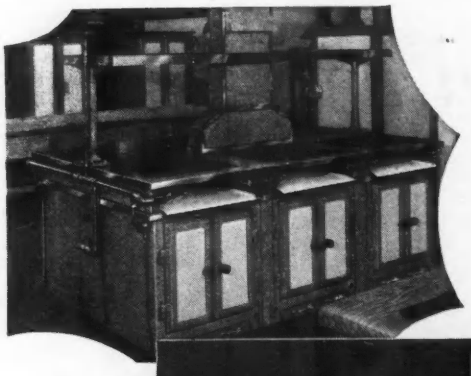

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GAS AND ELECTRICITY BOARD FINANCE*

By F. E. PRICE, F.S.A.A., A.I.M.T.A.,
Member of Wales Gas Board, Member of Cwmbran Development Corporation

THE new organisation of electricity and gas supply affords some interesting contrasts with former municipal control of these undertakings. There can be no doubt that the local authorities took understandable pride in the development of the efficient undertakings which they handed over to the new boards. As representatives of the electors they were also representatives of the consumers so that their decisions on matters of policy were based on wider considerations than those of mere owners of the undertaking. Indeed it seems evident from the statistics available that the undertakings were run almost entirely from the standpoint of giving the consumer as cheap a service as possible, and not for the purpose of producing profits for relief of rates. Municipal administration of trading undertakings was subject to much the same degree of publicity as the administration of rate fund services and the decisions of local authorities were always open to public comment.

For this local control there has been substituted control by public boards appointed by the Minister, who is answerable to Parliament for the ultimate success of the undertakings.

The consumer's interest is now represented by the consultative councils and their district committees. They have power to consider tariffs, services, and facilities, and to report and make representations to the board, and they must be informed of the board's general plans and arrangements; the consultative council may make representations to the Minister. They do not control the board and their consent is not required for any purpose. Nevertheless, the consultative councils are a channel through which consumers may make their views felt and through which the board may ascertain local opinion.

Degree of Autonomy

Comparison of the relevant statutory provisions makes it clear that gas boards enjoy a greater degree of autonomy than do electricity boards. Each gas board is required, taking one year with another, to be self-supporting after meeting all expenses properly chargeable to revenue account. There is no corresponding requirement for an electricity board. The Act requires that the electricity industry as a whole (embracing the 14 area boards and the B.E.A.) shall be self-supporting. This apparently permits of some boards making profits and others making losses, provided that the industry as a whole, taking one year with another, pays its way. Thus, during 1948-49 the B.E.A. itself and two area boards incurred deficiencies, but the overall surplus for the industry as a whole was £4,391,684.

As regards tariffs, electricity boards are subject to any directions given by the B.E.A. Indeed, the B.E.A. are empowered to direct an area board to submit proposals for varying or replacing tariffs in force in the area or part of the area. There are no corresponding provisions in the Gas Act, and gas boards are, therefore, free to determine their own tariffs.

It would also seem that the finances of electricity boards can be appreciably modified by action of the B.E.A. For instance, the B.E.A. are empowered to fix different bulk supply tariffs for different area boards. Again, contributions to the central reserve fund by area boards are to be such as the B.E.A. may determine. It would appear that these contributions are not bound to be on a uniform basis, though in 1948-49 the contributions by the 12 boards which made surpluses represented approximately 1% of the gross revenue of those boards.

If the accounts of an electricity board show a loss, this loss may be either :—

(*a*) Carried forward to be made good in a succeeding year;
(*b*) met from the area reserve fund (if any); or
(*c*) met by a contribution from the central reserve fund.

In 1948-49 two electricity boards sustained deficiencies which, in the absence of area reserve funds and of contributions from the central reserve fund, were carried forward.

Temporary Borrowing

The B.E.A. and any area electricity board may, with the consent of the Minister and the approval of the Treasury, borrow temporarily by way of overdraft or otherwise such sums as they may require to discharge their functions. In this connection it is interesting to note the banking arrangements entered into by the electricity industry. Main bank accounts have been opened in the names of the B.E.A., each of the 14 generation divisions, and each of the 14 area boards. An aggregate balance is to be maintained on the main accounts within agreed limits, any excess over the maximum being placed on deposit account with the banks, who also advance on temporary loan (guaranteed by the Treasury) any sums necessary to make up the minimum. Agreed minimum and maximum balances, forming part of the agreed aggregate balance, have also been fixed for each division and area board main account, which are maintained by transfers made by the banks to or from the B.E.A.'s main account.

One consequence of this arrangement appears to be that the area boards will have no occasion to exercise their power to borrow temporarily since their bank balances are automatically maintained. It follows, too, that advances to meet capital expenditure and sums required for interest payments or set aside for amortisation of capital will not be the subject of separate transfers between the area boards and the B.E.A. The resultant economy in the utilisation of the cash resources of the industry as a whole is obvious, but the system may detract from the interest that the area boards can take in financial administration.

The provisions of the Gas Act as to temporary borrowing by area boards and the Gas Council are similar to those of the Electricity Act. The gas industry has not, so far, adopted banking arrangements similar to those taken up by the electricity industry, and those arrangements may be less appropriate in view of the different relationship between the Gas Council and the area boards under the Gas Act.

Whether the gas industry will adopt consolidated loans fund principles in dealing with borrowings by the Gas Council on behalf of the area boards remains to be seen. The relationship between the Gas Council and the area gas boards on the one hand, and the relationship between the B.E.A. and the area electricity boards on the other hand, are by no means identical. The provisions relating to stock in the two Acts are different. The Gas Act requires the Gas Council to make a scheme which shall provide 'for allocating to the area boards responsibility in respect of any stock issued for the purpose of satisfying rights to compensation, having regard to the extent to which the assets . . . vest by virtue of the Act in, or are subsequently transferred to, the respective area boards.' The same form of words is used as regards other stock issued by the Gas Council. There is no corresponding language in the Electricity Act.

There is, too, the provision under which payments by an area board to the Gas Council in respect of interest on British Gas Stock are deemed to be annual payments; this has no counterpart in the Electricity Act. The prime reason for this provision is presumably income tax, to which each area gas board will be separately assessed, while the electricity industry is assessed as one entity in the hands of the B.E.A.

Depreciation

A question offering scope for controversy and of fundamental importance to the future financial health of the nationalised industries is the amortisation of capital.

The pre-nationalisation methods adopted by gas and electricity undertakers in providing for depreciation or its equiva-

* From a paper on Some Aspects of Public Board Finance, presented to the annual meeting of the Institute of Municipal Treasurers and Accountants, Harrogate.

lent differed according to the type of undertaker. The loans raised by local authorities to finance their capital expenditure were subject to annual provision for redemption within the repayment periods allowed by the statutory borrowing powers, such periods being based on the lives of the assets. The annual provision so made was usually at least equivalent to a full provision for depreciation.

In the case of electricity companies, the capital being permanent in character, the revenue account was usually debited with provision for the depreciation of the assets during the year.

In so far as the provision made by company or local authority undertakers was related to the lives of the assets employed, the effect was broadly the same, but the practice of local authorities to expedite debt redemption and to meet substantial amounts of capital expenditure from revenue often had the effect of increasing the total provision for amortisation of capital above the strict requirement for depreciation.

Gas companies usually followed the double account system, under which the capital assets were retained in the accounts at their original cost, the cost of renewing and maintaining the undertaking being charged to revenue account. Some gas companies provided depreciation in respect of certain short-lived assets, but this basis was rarely, if ever, extended to the whole of the assets. The net cost of assets of company undertakings vested in gas boards varies between £400 and £500 per mill. cu.ft. of gas sold, while for local authority undertakings the comparable figures are £130 to £200.

Post Nationalisation Practice

Section 45 of the Electricity Act, 1947, provides that electricity boards shall charge to revenue account in every year :—

(*a*) Proper provision for the redemption of capital;
(*b*) proper provision for the depreciation of assets or for renewal of assets; and
(*c*) all payments made to local authorities in reimbursement of loan charges on outstanding electricity debt.

Similar provisions are contained in Section 49 of the Gas Act, 1948.

It is explained in the first report and accounts of the British Electricity Authority that the Authority and the area boards decided in agreement to make comprehensive provision out of revenue each year for the discharge of capital expenditure by setting aside a total sum which, computed initially as the requisite provision for depreciation of assets, would contain provision for redemption of capital and for the element of principal in local authority loan charges. This annual provision for discharge of capital expenditure has thus a three-fold purpose. It provides, first, for the sums required to be carried to redemption fund accounts in respect of stock redemption fund contributions, and, second, for the amount of the element of principal in local authority loan charges reimbursed during the year, together with corresponding repayments of inherited loans. The remainder of the annual provision represents the amount which, in the view of the authority and the boards, measures proper provision for depreciation of assets, having regard to the sums already earmarked for the other purposes mentioned.

It appears probable that a similar interpretation will be adopted by the gas industry, though some hold the opinion that the renewals basis is to be preferred to the depreciation basis, particularly in regard to buildings, works, plant, mains, and services.

Life of Assets

For post-vesting expenditure the electricity industry has based depreciation on the periods or lives of the various classes or types of capital expenditure. The maximum periods formerly allowed by the Electricity Commissioners for repayment of loans have apparently been used as a guide.

As regards vested assets inherited from public authorities, the amount of expenditure remaining undischarged at vesting day was ascertained together with the unexpired period of the loan. In each case the depreciation provision for each remaining year was computed by applying the straight-line method to the amount of undischarged capital expenditure. In the case of assets inherited from company undertakings similar treatment was accorded in so far as the necessary particulars were available.

The 'renewals' basis of accounting, formerly widely adopted by gas companies will, it appears, be superseded by the 'depreciation' basis. Under the depreciation system of accounting the cost of renewals will be capitalised instead of being met from revenue. This change may have, for the time being, the effect of relieving revenue at the expense of capital. This might occur, for instance, where the year's provision for renewals at present-day costs would exceed the provision for depreciation (which would be based mainly on pre-war costs).

Stock Redemption Funds

Both the B.E.A. and the Gas Council are required by regulations made under their respective Acts to establish stock redemption funds. A separate fund is required for stock for which a different redemption period is prescribed. For compensation stocks the prescribed period is 90 years. Contributions may be on an accumulating or non-accumulating basis.

The depreciation provision made by the Electricity Boards for 1948-49 amounts to £31,307,104. This includes (*inter alia*) the following items :—

	£
Contributions to stock redemption fund ...	3,799,127
Local authorities 'loan repayments'	13,295,661

The contribution to the stock redemption funds represents one-ninetieth of the amount of compensation stock (*viz.*, £341,921,407). The period of 90 years has no relation to either the life of the electricity stocks or the lives of the assets taken over. The stock redemption fund does not appear as a separate item in the balance sheet and its purpose is not apparent, except possibly as a paragraph in a stock prospectus. If it were intended to achieve the ultimate extinction of the electricity stocks, the contributions to it should be made additional to, and not out of, the provision for depreciation.

Tariff Policy

There is nothing in either the Electricity Act or the Gas Act which requires either immediate or ultimate equalisation of charges over the country as a whole or over the area served by a board. Indeed, the Electricity Act provides specifically that the B.E.A. may fix different bulk supply charges for different area boards.

The policy of the B.E.A. and the area boards is to simplify the existing tariff structure by eliminating obsolete methods of charge and reducing the number of types of tariffs. The report states : 'It does not follow that complete national uniformity of charge for each class of consumer is either practicable or desirable.'

The problems confronting the gas industry are of a similar character and one imagines that their policy will not be widely different from that of the electricity industry. There are a number of instances where the cost of supplying gas by small undertakings exceeds the price which consumers can reasonably be asked to pay. In these cases the price of gas will no doubt be subsidised by the more prosperous undertakings.

Rating

Section 11 of the Electricity Act provides that nothing in the Act shall be deemed to exempt any electricity board from any liability for any tax, duty, rate, levy, or other charge, whether general or local. This provision must be read in conjunction with Part V of the Local Government Act, 1948, under which any premises forming part of a hereditament occupied by the B.E.A. or an electricity board are no longer to be rated (except premises used as a dwelling house). Instead of each undertaking being assessed in the usual way, the B.E.A. makes a global payment, on behalf of the whole industry, to the Minister of Health, who distributes the amount to local authorities in accordance with the provisions of Section 100 of the Local Government Act, 1948. For 1948-49 the payment in respect of England and Wales was £11,250,000 (the

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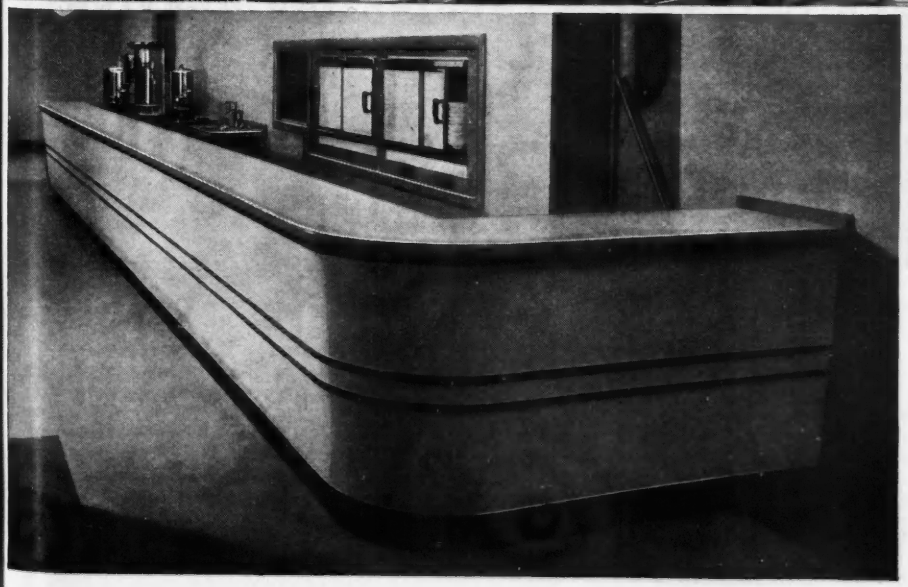

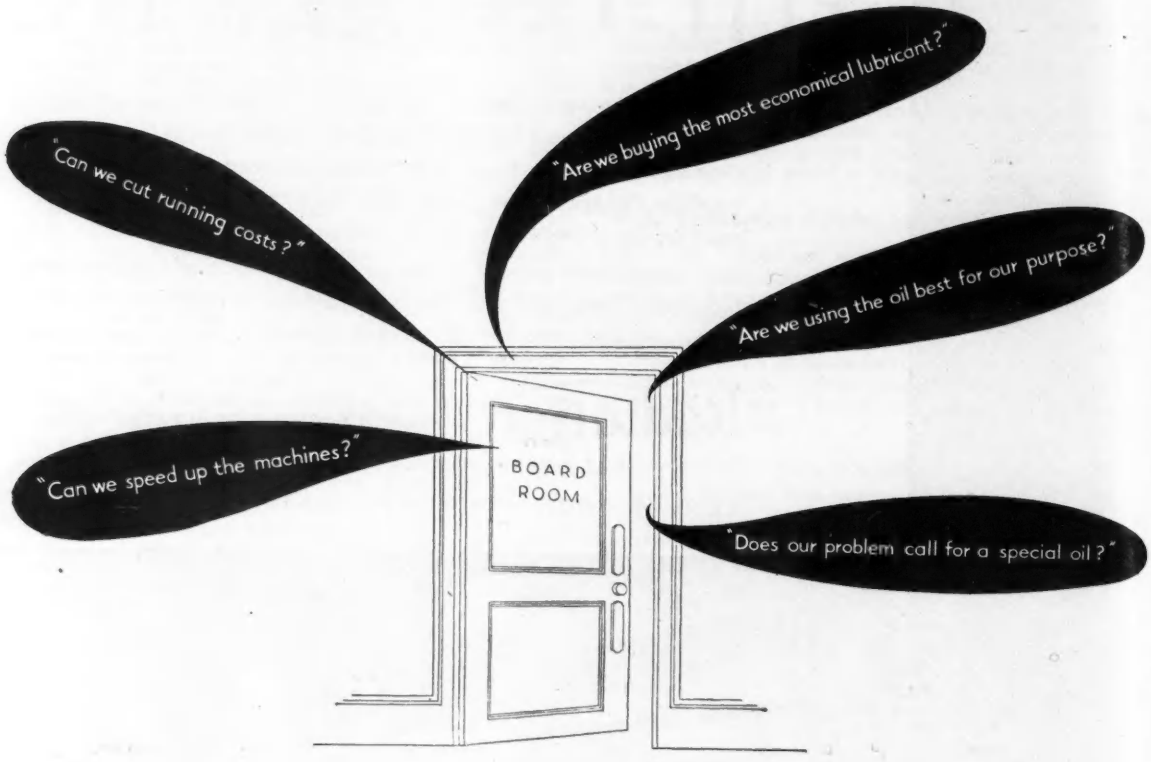
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standard amount). This standard amount is, in subsequent years, to be adjusted by reference to :—

(*a*) Changes in average rate levied ; and

(*b*) changes in the quantity of electricity supplied.

Section 13 of the Gas Act contains similar provisions to those of Section 11 of the Electricity Act, but the provisions of Part V of the Local Government Act, 1948, have not been applied to the gas industry, which therefore remains rateable on the same basis as hitherto. But for the provisions of Part V of the Local Government Act, 1948, it would have been necessary to apportion the rating assessments of all electricity undertakings between those hereditaments (*e.g.*, generation) which vested in the B.E.A. and those (*e.g.*, distribution) vested in the appropriate area boards. A similar problem did not arise on the vesting of gas undertakings, which, as a rule, were transferred wholly to one area board or another. It may be a little unfair to the gas industry if the benefit of any reduction in rate poundage due to the general revaluation is partially discounted by increased rateable values, whereas the electricity industry obtains the whole benefit of the reduction in rate poundage. The question of applying Part V of the 1948 Act to the gas industry has been considered by a committee of the Gas Council, but so far as is known no recommendation has yet been made.

Internal Organisation

The internal organisation of electricity and gas boards has been the subject of considerable discussion and, indeed, controversy. The main criticism appears to be that the organisation is over-centralised and that there is too much red tape.

The chief argument against centralisation is that it abrogates the authority of local officials, undermines their prestige, and discourages initiative. This situation is said to affect consumer-relations inasmuch as a local manager may be afraid to give advice, not because he is incapable of dealing with the problem, but because he is afraid of incurring criticism from a divisional or area official. A further criticism is that the credit for successful work goes to the headquarters officials when it may belong to the local manager.

It must, however, be remembered that the ultimate responsibility for the successful conduct of the nationalised industries rests on the area boards. Supervision by headquarters through, maybe, sub-area and/or divisional organisation, is inevitable. The real problem lies in the extent to which, and the manner in which, this supervision should be applied.

The term 'centralisation' is loosely used, often without a precise appreciation of its significance. For instance, a distinction may be drawn between centralisation as applied to (*a*) managerial and executive functions, and (*b*) financial and accountancy functions. Different degrees of centralisation of these two functions might well exist side by side.

Some measure of centralisation of accountancy is inevitable where individual undertakings or units are too small to support economical separate accounting staffs. In any event, centralisation, so far as it affords scope for mechanised accounting in connection with billing, wages, stores, and costing, appears to be advantageous. The degree of centralisation or perhaps concentration of accountancy work obviously needs careful consideration. Complete centralisation at board headquarters would usually be impracticable and the organisation of accountancy work at divisional or group level is more usual.

Gas undertakings are, generally speaking, physically separate units of production and distribution, except as regards bulk supplies from one undertaking to another. In this respect they differ from electricity undertakings, which are connected directly or indirectly to the grid.

Although the annual reports of the gas industry have not yet made their appearance it would seem that the pattern of the electricity industry has, in varying degrees, been followed. One board has adopted an organisation calculated to avoid as far as possible the disadvantages of centralisation by retaining the greatest measure of responsibility in the hands of managers of individual undertakings. Under this organisation the individual undertakings have been formed into groups and the managers constituted into group committees, which meet monthly to discuss the affairs of all undertakings in the group and make such recommendations to the area board as appear to be needed. The group committee does not derogate from the prime responsibility of each manager for his own undertaking and he continues to be answerable for the day-to-day administration of the undertaking and its financial progress.

Accountancy work is centred at group level, a group accountant with appropriate staff being responsible for all the accountancy work of the undertakings within the group. The group accountant is the servant of the individual undertakings, but has a functional responsibility to the board's chief accountant. He is also responsible for the collection and collation of statistical and financial returns in respect of each undertaking and transmitting them to board headquarters. Under this system of organisation the size of the board's headquarters financial staff may be kept at a relatively modest level, dealing with matters of general policy and administrative co-ordination.

It appears to be the practice of area boards to call for annual or half-yearly budgets from the undertakings under their control. These budgets, which usually take the form of an estimated revenue account, serve two purposes, viz. : (*a*) They enable the level of charges made by each undertaking to be reviewed in the light of anticipated expenditure, a matter of special importance in a period of rising costs; and (*b*) they enable a consolidated budget for the board as a whole to be prepared before the commencement of the financial year, so that the board may obtain an approximate picture of the year's trading. The budgets serve a further useful purpose if, at the end of each year or half-year, the actual results of each undertaking are compared with the budget, explanations being sought for any large discrepancies.

Control of capital expenditure is of manifest importance. It has two aspects, *viz.*, the consideration of individual proposals for capital expenditure, and the periodical preparation of a programme of contemplated works covering a period of three to five years.

It has been found valuable to call for a monthly return of working results from each undertaking. The information in respect of gas undertakings, for instance, would include such matters as wages paid; number of consumers (with gain or loss on the month); sale of appliances (with the equivalent per 100 consumers); gas sent out during the month (with percentage increase or decrease compared with corresponding month of the previous year); gas sent out during the year to date (with percentage increase or decrease); thermal efficiency of coal gas; coal carbonised and gas made per ton; coke made (and equivalent per ton of coal); number of employees (this year compared with last year). This information is tabulated separately for each undertaking, totals being furnished for each group or division and for the area board as a whole. These returns are scrutinised by the technical and finance departments of the board, but it is also found that board members take a keen interest in them.

Internal Audit

The scope of internal audit is determined partly by the scope of the professional audit, and partly by the extent to which accountancy work has been centralised, and the number of small undertakings where the normal principles of internal check cannot be effectively employed. The internal audit system should be under the direct control of the board's chief accountant, to whom, through the senior internal auditor, each internal auditor should be required to make periodical reports on each undertaking.

The scope of the internal audit would normally extend to all expenditure and income, including invoices, wages, national insurance contributions, superannuation contributions, stores (including showroom stocks), income from sale of energy (particularly as regards new consumers, &c.), sales of fittings, chargeable work, sales of residuals, petty cash, &c. The financial internal audit might be supplemented by an efficiency audit, under which accounting systems in operation in individual undertakings undergo periodical review.

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TRADE NEWS

After 11 years of curtailed publicity **Commer Cars, Ltd.,** Luton, have re-introduced their system of advising old and potential customers of Commer developments from time to time. As a first step they have issued an attractively printed folder illustrating the Commer range, from 8 cwt. to 8 tons, of vehicles for almost every road transport task. The folder is accompanied by the latest price list.

We have received from the **Chaseside Engineering Co., Ltd.,** copies of two well produced and illustrated catalogues, one specifically prepared for the prospective Chaseside customer in Canada, headed 'The Experienced Shovel,' and the other an almost identical 'translation' for the English market, headed 'More than a front end loader.' The production of the Canadian catalogue is the outcome of three years' hard work in persuading Canadian users of the suitability of Chaseside equipment, an effort which is reported now to be showing good results. The address of the Canadian concern is Chaseside Engineering Co. (Canada), Ltd., 503, Terminal Building, Toronto, Ontario. There will be no difficulty in presenting further Canadian literature illustrated exclusively by photographs of Chaseside equipment at work in Canada, as among users in that country the company is now able to number the Hydro-Electric Power Commission of Ontario, the Department of Mines and Resources, Banff, and the British Columbia Electric Railway Co. of Victoria, British Columbia.

We have received from **Steels Engineering Products, Ltd.,** an illustrated description of the Coles telpher hoist, comprising an electric hoist mounted between an electric travelling trolley and a driver's cab. The unit is useful where a high travelling speed is required over uneven ground, an obstructed area, or water, thus preventing the operator following the hoist on foot.

The driver's cab is suspended in a position to afford the operator a clear, uninterrupted view of the load and working area. Hoisting and travelling are controlled from a push-button control box by the driver seated in the cab. The hoists are manufactured in 1, 2, 3 and 6-ton models for A.C. or D.C. supplies. A creeping speed attachment (for A.C. supply only), can be fitted to give approximately 10% of normal lifting and lowering speeds.

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COMPANY NEWS

Midland Brass Fittings Co., Ltd.—The annual meeting for the year ended Mar. 31 was held on Aug. 30. Mr. Geo. R. Morris presided. The report and accounts for the year showed that the Company continued to prosper and to maintain its position in the fittings trade. The report was approved, the balance sheet adopted and the retiring director re-elected.

Thomas De La Rue & Co., Ltd.—Presiding at the 53rd annual meeting of Thomas De La Rue & Co., Ltd., at the Dorchester Hotel, Park Lane, on September 13, Mr. B. C. Westall, C.B.E., said that with regard to the Company's interests in gas appliances they had now completed the closing down of the Gateshead factory, which comprised leasehold premises, and had transferred the plant to other factories. This concentration was now beginning to show results. The losses in the previous year and in the year under review, consequent upon the restricted production of gas water heaters owing to the incidence of purchase tax, had now been eliminated. In their report the Directors stated that they did not anticipate that this division, as a whole, would make a profit in this financial year. He was not without hopes that this might prove to be a pessimistic statement. A final dividend of 35%, less tax, making 50% for the year, was approved. The retiring Directors, Mr. E. G. Gough, Mr. Eric Davies and Lord Killearn of Killearn, P.C., G.C.M.G., C.B., M.V.O., were re-elected.

United Gas Industries, Ltd.—The annual report and accounts of United Gas Industries, Ltd., for the year ended March 31 reveal satisfactory trading results. The consolidated profit and loss account shows that the Directors propose a final dividend of 12% on Ordinary shares, making 17% for the year, and a dividend of 1s. 9d. per share on the Deferred shares (both same as last year). A transfer of £50,000 is to be made to general reserve. Provision has been made for depreciation of the company's assets and of the assets of the subsidiary companies, comprising Smith Meters, Ltd., Willey & Co., Ltd., J. H. Robinson & Co. (Liverpool), Ltd., Vulcan Stove Co., Ltd., Sutherland Meter Co., Ltd., Nicholls & Lewis, Ltd., and Midland Enamelling Co.

Publication Received

A further pamphlet in the 'Raw Material Survey Series,' published by the Purchasing Officers' Association (146a, Queen Victoria Street, E.C.4, price 2s. 6d.), has been contributed by J. F. Blitz 'to assist the reader to gain an insight into some of Britain's post-war economic problems.' The present pamphlet deals mainly with Britain's external economy, emphasis being laid on the contention that the costs of producing British exports, visible and invisible, must harmonise with those of similar goods and services in other countries.

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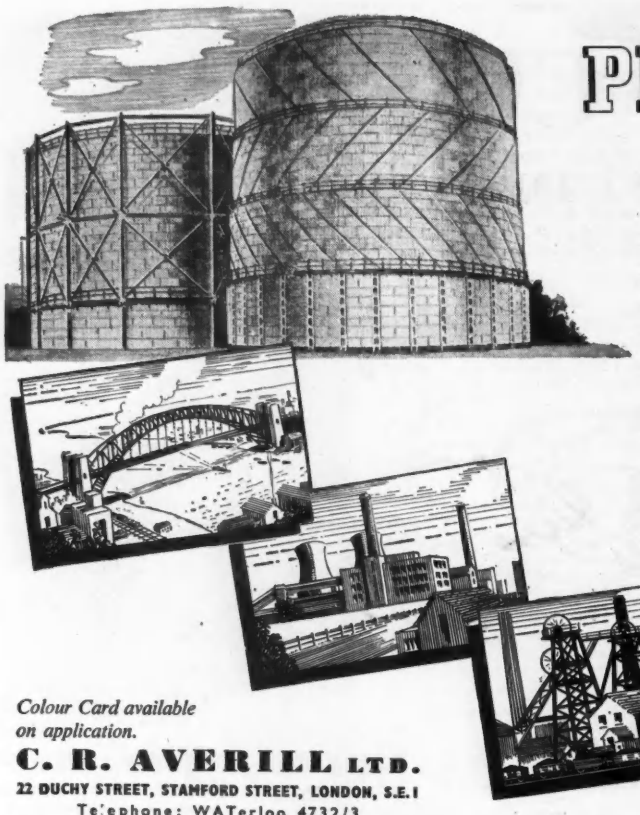

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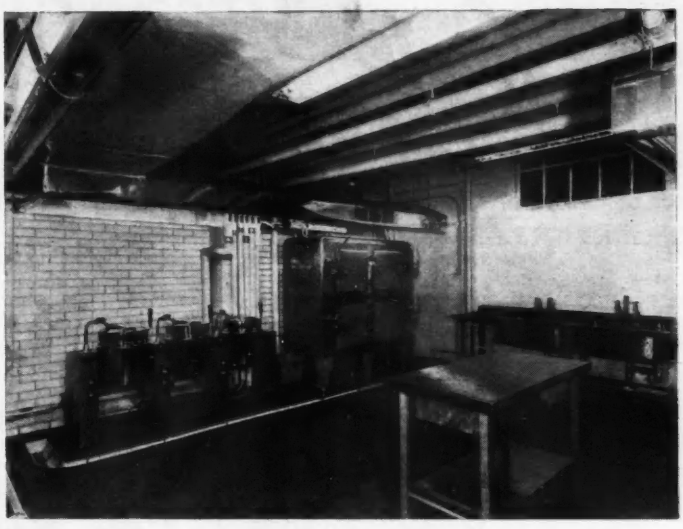
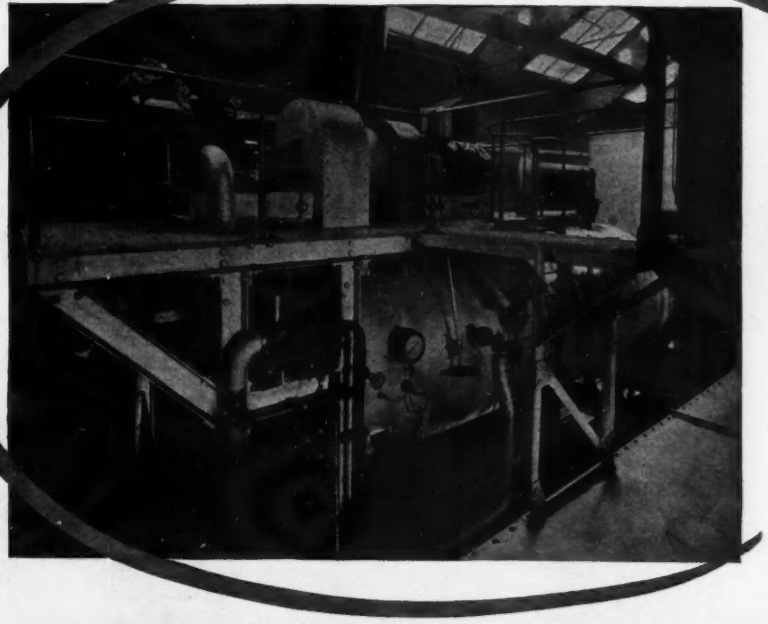


Part of the new kitchen equipment of the Great Room, Grosvenor House, Park Lane, W.1.



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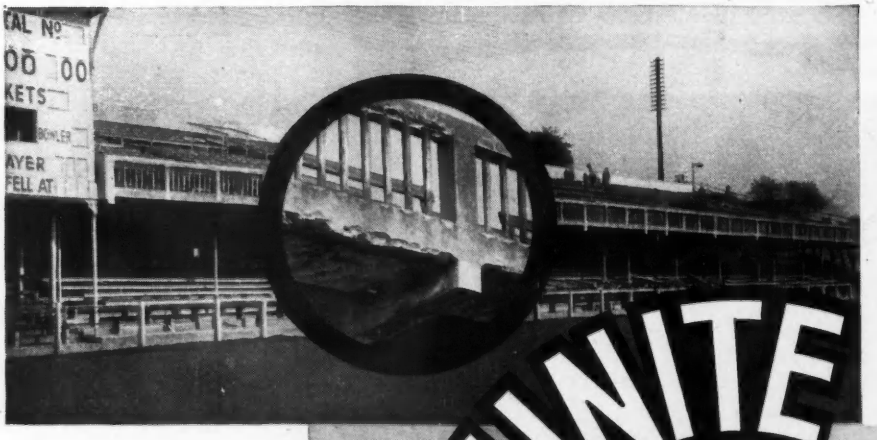

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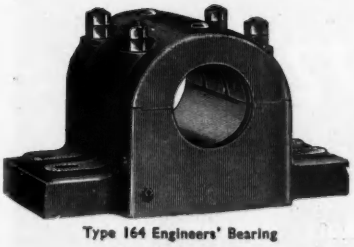

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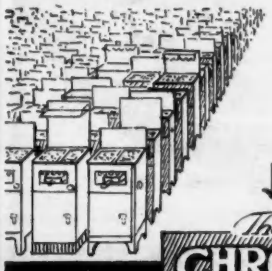

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The Herring Fisheries 1850

THE HERRING FISHERIES.—The official report on the herring trade in Stettin for the past season has been published. It appears that the import of Scotch herrings into Stettin for the past year has amounted to 150,000 barrels, being fully a third more than the importation of any previous year. The extra sale is no doubt attributable to the extremely low price to which the article had fallen in consequence of the superabundant supply.

TOMB OF THE REGENT MURRAY.—A second inspection has been made of the Regent Murray's vault in St Giles's Church, and it is stated that besides the two coffins formerly noticed, a third, a leaden one, bearing the marks of great age and of peculiar construction, being shaped so as to fit the head and body exactly, had been found. There was no inscription on this coffin, it having most probably been forced off when the other coffins on top of it ... [illegible]

Excerpt from "THE SCOTSMAN" Saturday, February 16th, 1850.

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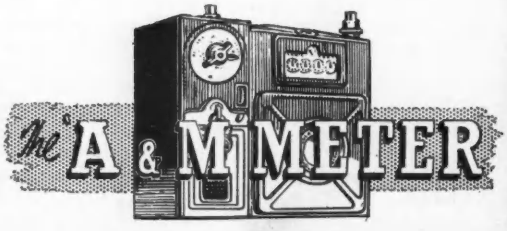

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WELL-ESTABLISHED REPRESENTATIVE required South Eastern, Southern, South Western Areas. Good remuneration and prospects for first-class man.

Address No. 9928, *Gas Journal*, 11, Bolt Court Fleet Street, London, E.C.4.

OPERATING ENGINEERS required. Age 21 to 25. Must have experience of operating gasworks and coke oven carbonising plant. Permanent jobs for suitable men.

Apply in writing, giving particulars of age, education and experience, to the Personnel Officer, The Woodall-Duckham Co., 63-77, Brompton Road, London, S.W.3.

DRAUGHTSMAN with sound knowledge of gasworks and allied chemical plant design required. Age 35 or upwards. Pension scheme. Permanent position to suitable applicant.

Fullest details of experience, age and salary, to R. & J. DEMPSTER, LTD., Gas Plant Works, Manchester, 10

WEST MIDLANDS GAS BOARD

EDUCATION OFFICER.

THE Board invites applications for the post of EDUCATION OFFICER. Preference will be given to an applicant with a University Degree or an appropriate professional qualification and experience of education in industry.

The person appointed will be responsible for the direction of the Board's policy in relation to the training and further education of staff and employees.

The salary will commence at £1,000 and will rise by annual increments of £50 to £1,250, and the appointment will be subject to such superannuation regulations as the Board may, in due course, adopt.

Applications, stating age and giving details of experience and qualifications, and giving the names of two referees, should be addressed to the Personnel and Establishment Officer, West Midlands Gas Board, Gas Offices, Edmund Street, Birmingham, 3, to reach him not later than September 30, 1950. Applicants are requested to quote reference T.P.3 when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION.
COVENTRY DISTRICT.
RETORT AND BUILDING SUPERVISOR.

APPLICATIONS are invited from suitably qualified persons for the above position at Foleshill Gasworks, Coventry.

Candidates should have a good knowledge and experience of the construction, starting up, repair and maintenance, and temperature control, of vertical and horizontal retort settings.

A good knowledge of foundations and general building construction is also essential, together with ability to control all grades of refractory and general building trades labour.

The commencing salary will be within the range £595 to £720 per annum, in accordance with Grade 11 A.P.T. Provincial 'A' of the Salary Scales of the National Joint Council for Gas Staffs, and will be subject to such superannuation regulations as the Board may, in due course, adopt. A four-roomed flat at a reasonable rent is available, if required.

Applications, giving details of age, qualifications and experience, together with the names of two referees, should be addressed to Mr. A. Allen, Divisional Manager, West Midlands Gas Board, Warwickshire Division, Gas Street, Coventry, to reach him not later than 14 days after the appearance of this advertisement. Applicants are requested to quote reference T.P.3 when replying to this advertisement.

F. H. CURETON,
Secretary.

SOUTH EASTERN GAS BOARD

JUNIOR DRAUGHTSMAN.
PHYSICAL LABORATORIES,
OLD KENT ROAD.

APPLICATIONS are invited for the above-mentioned position.

Applicants should have had engineering workshop training, preferably with a knowledge of furnace construction, mechanical handling practice and the design of gas appliances.

The commencing salary will be within the range £280-£450 according to experience.

Applications in writing, quoting reference VAC/99, giving details of age, present occupation, qualifications, experience, &c., should reach the undersigned not later than 14 days after publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon

SOUTH EASTERN GAS BOARD

WEST SURREY DIVISION.
HOME SERVICE ADVISER.

APPLICATIONS are invited for the position of a HOME SERVICE ADVISER in the West Surrey Division.

Applicants must be over 21 years of age and possess a diploma in Domestic Science. They should also have had experience in giving demonstrations to the public.

The commencing salary will be within Grade III (Metropolitan Area) of the Salary Scales of the National Joint Council for Gas Staffs in respect of Female Administrative, Professional and Technical Staffs (£224-£344 per annum).

Applications (quoting reference VAC/97), giving details of age, present occupation, qualifications, experience, &c., should reach the undersigned not later than 14 days after publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SCOTTISH GAS BOARD

EDINBURGH AND SOUTH EAST DIVISION.
EDINBURGH GROUP.
GROUP TECHNICAL ASSISTANT.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT within the above Group.

The successful candidate will be required to give technical assistance to the District Manager of the Dalkeith and Penicuik Districts, and a free house will be provided at Penicuik. He may also be required to give technical assistance to other undertakings within the Group.

The salary scale for the position is £435-£515 per annum, and placing on the scale will be given in accordance with experience and qualifications.

Applicants should have had a sound training in gas engineering and experience in the operation and maintenance of horizontal settings will be an advantage.

The successful candidate will be required to pass a medical examination and will be subject to the provision of any superannuation scheme which the Board may introduce.

Applications, stating age, training, qualifications and experience, accompanied by *copies* of not more than three Testimonials, should be made to the undersigned not later than first post on Monday, October 2, 1950.

DAVID BEAVIS,
Group Manager.

(Classified advertisements continued on Supplement 10)

REPAIRS

BRIGHT, SON & CO.
(CLERKENWELL) LTD.
FOR PUBLIC LIGHTING.
CLOCK CONTROLLER REPAIRS.

20 Northburgh St. Clerkenwell, E.C.1. Clerkenwell 7171. and at 17 & 18, Gt. Sutton St. Clerkenwell, E.C.1. London Wall 0267.

PAYNE & FLOOD, LTD., 182, Oldham Road, Manchester, 4, Phone Col. 1393, are in a position to undertake all types CARBONIZING PLANT REPAIRS, Retort House Reconstruction, Producer Relinings, Hot and Cold Patching, Structural Steelwork Erected and Dismantled. Expert advice available.

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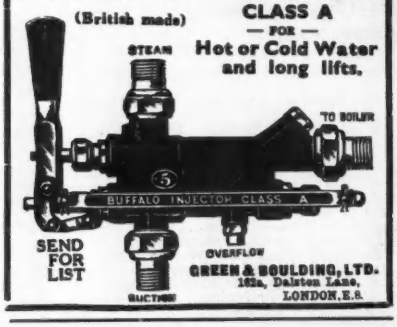
(PROPS: E. E. JEAVONS & Co. Ltd)
TIPTON · STAFFS
'Phone: TIPTON 2161 'Grams: PIPELINES TIPTON

BUFFALO INJECTOR
(British made)
CLASS A
— FOR —
Hot or Cold Water and long lifts.



SEND FOR LIST

GREEN & BOULDING, LTD.
182a, Dalston Lane, LONDON, E.8.

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.
NATURAL BRITISH.
DUTCH BOG ORE.
SPENT OXIDE.
LONDON ROAD, LEICESTER.
Telegrams: "BRIPURIMAT"
Telephone: 59086

PLANT FOR SALE & WANTED

WANTED. GAS COMPRESSOR with capacity of approximately 60,000 cu.ft. per hour (N.T.P.) at delivery pressure of 10 lb./sq. in. maximum. Steam or electric drive.
State delivery and price to No. 9929, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

PHONE 98 STAINES.

FOR SALE. W.S. CYLINDRICAL ENCLOSED TANKS: 12,000, 5,000, 2,000 and 1,000 gal.
STEEL SECTIONAL TANKS: 36 ft. by 12 ft. by 8 ft., 12 ft. by 8 ft. by 5 ft., and two 16 ft. by 8 ft. by 4 ft.
DIESEL LOCOMOTIVE, 20 h.p., 24 in. gauge.
VERTICAL H.S. STEAM ENGINES, 30-350 h.p.
AIR COMPRESSORS: B. & W., 450 c.f.p.m., 100 lb. working pressure.; A. & M., 300 c.f.p.m., 80 lb. working pressure. Also large selection AIR RECEIVERS.
LANCASHIRE BOILERS: 30 ft. by 8 ft. 6 in. and 28 ft. by 8 ft., 140 and 150 lb. working pressure.
HARRY H. GARDAM & Co., LTD.

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NON-SETTING PAINT

Used by the leading Gas Companies for the protection of lower plates and cuppings of Gasholders. The most efficient anti-corrosion paint in existence. HUMIDINE never cracks, never dries and is absolutely impervious to water. OXYGRAFITE GASWORKS PAINT is also manufactured by . . .

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CARLETON - SKIPTON : YORKS
TELEPHONES: SKIPTON 548/9

n.h.d.

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THE WORLD'S FINEST
FIRE-PROOF NON-CONDUCTING
material for
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of every description

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Imperishable
JOINTING PASTE | IRON CEMENT
HAWKINS
Non-poisonous, cheaper and better than red lead, ideal for gas, steam or water.
Looks like iron, can be buffed burnished or drilled and automatically caulks itself into any joint.
W. T. HAWKINS & Co.
CHAPEL HILL - - - - - - - - HUDDERSFIELD
Send for Sample Tin POST FREE.

THE "FLUXITE QUINS" AT WORK
"'The Little Old Home by the Sea,'
A nice piece o' painting" cried EE.
Yelled Oi "Pr'aps you're right,
But through lack of FLUXITE
It's a dud piece o' plumbing strikes me!"

For all SOLDERING work—you need FLUXITE—the paste flux—with which even dirty metals are soldered and "tinned." It does not "poison" the solder nor corrode the metal—and can be used with safety even on sensitive apparatus.
With Fluxite, joints can be "wiped" successfully that are *impossible by any other method.*
FLUXITE has been used for over 40 years in Government Works and by the leading Engineers and Manufacturers. OF ALL IRONMONGERS—in tins—10d. 1s. 6d., and 3s. 0d.

The FLUXITE GUN puts FLUXITE where you want it by a simple pressure. Price 2s. 6d. or filled 3s. 6d.

ALL MECHANICS WILL HAVE

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IT SIMPLIFIES ALL SOLDERING

Write for Leaflets on CASE HARDENING STEEL and TEMPERING TOOLS with FLUXITE also on "WIPED JOINTS." Price 1d. each.
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WET AND DRY
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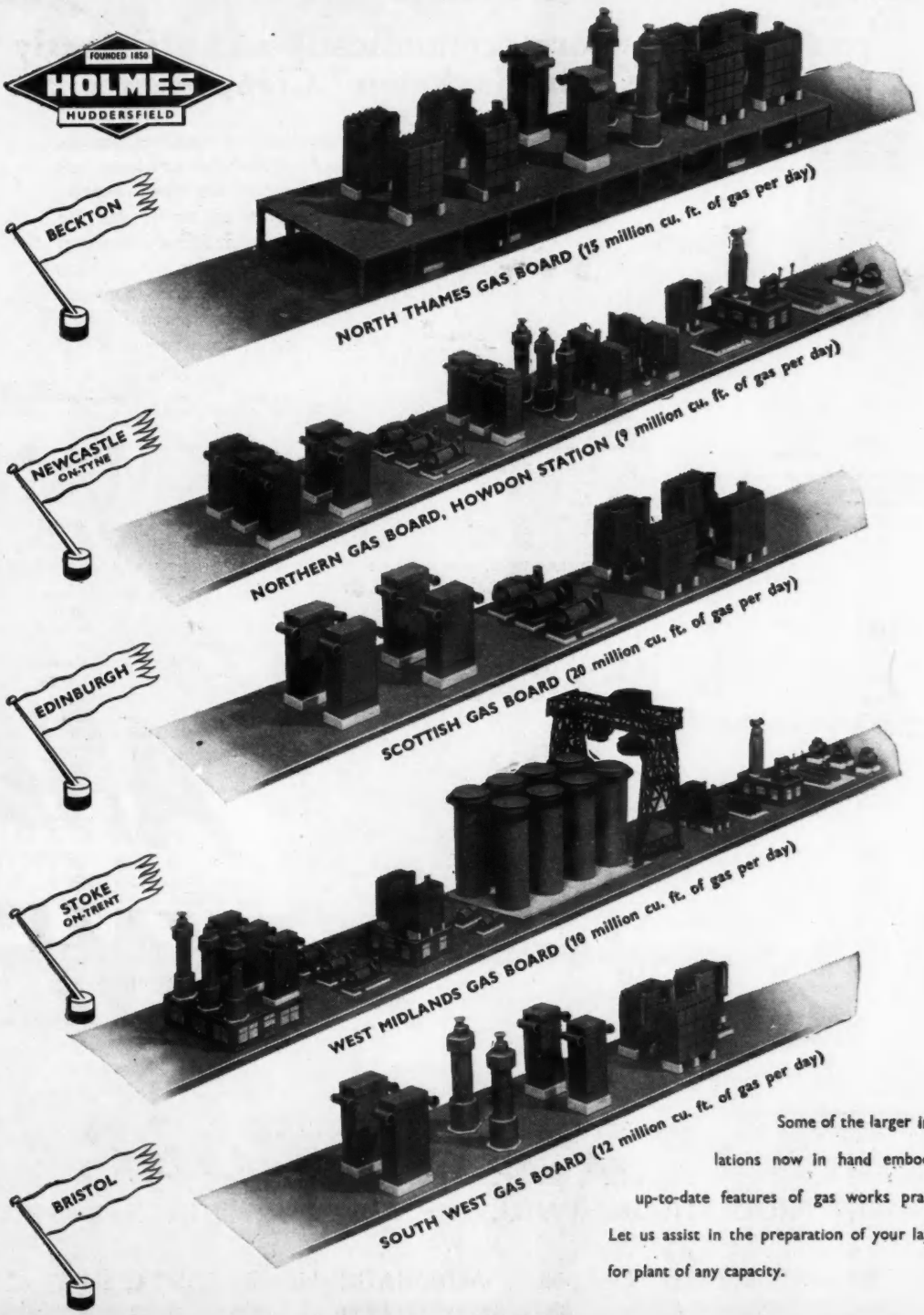
BECKTON
NORTH THAMES GAS BOARD (15 million cu. ft. of gas per day)
NEWCASTLE ON-TYNE
NORTHERN GAS BOARD, HOWDON STATION (9 million cu. ft. of gas per day)
EDINBURGH
SCOTTISH GAS BOARD (20 million cu. ft. of gas per day)
STOKE ON-TRENT
WEST MIDLANDS GAS BOARD (10 million cu. ft. of gas per day)
BRISTOL
SOUTH WEST GAS BOARD (12 million cu. ft. of gas per day)

Some of the larger installations now in hand embodying up-to-date features of gas works practice. Let us assist in the preparation of your lay-out for plant of any capacity.

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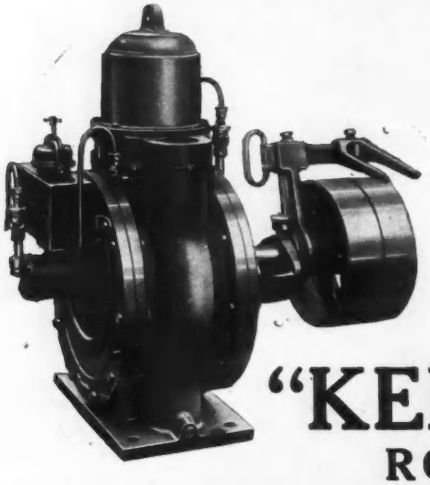
When pressure of Gas or Air has to be increased up to 5 lbs. p.s.i..

you can do it more economically and efficiently with these "Keith-Blackman" Compressors ....



THE machine illustrated in this advertisement is our Type 4, fitted with fast and loose belt pulleys and striking gear. This type is especially suitable for compressing air or gas for ndustrial purposes, such as furnace heating, ¡metal melting, brazing, soldering, etc. . . This type is made in several sizes, and there are many other types, in various sizes and for all drives, for dealing with volumes up to 20,000 cubic feet per hour.

Ask for a copy of our Cat. G 57.

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ROTARY COMPRESSORS

KEITH BLACKMAN LTD., MILL MEAD RD., LONDON, N.17. TN: TOTTENHAM 4522. TA: "KEITHBLAC NORPHONE LONDON."
And at Manchester Birmingham Leeds Newcastle-on-Tyne Glasgow Belfast and Penarth nr. Cardiff.

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"GUNFIRE" PRODUCTIONS WILL SOLVE YOUR LIGHTING PROBLEMS

BY

THE BRITISH, FOREIGN & COLONIAL AUTOMATIC LIGHT CONTROLLING CO. LTD

BOURNEMOUTH

ESTABLISHED OVER HALF A CENTURY

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West's Gas IMPROVEMENT CO., LTD.

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Office: COLUMBIA HOUSE, ALDWYCH, W.C.2. Telephone: HOLborn 4108-9. Telegrams: Wesgasco, Estrand.

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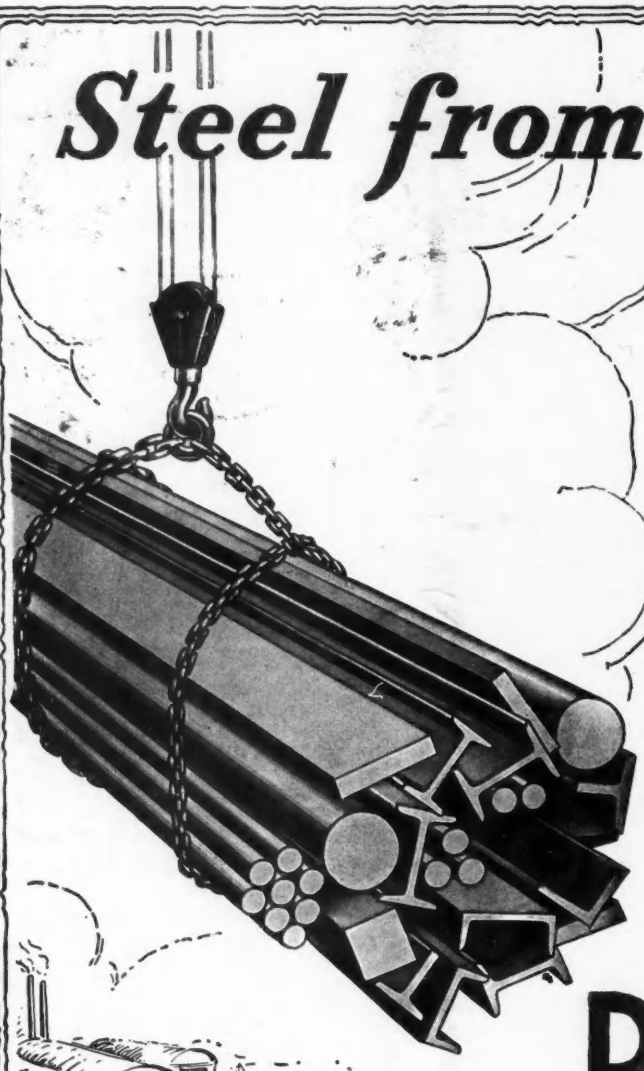

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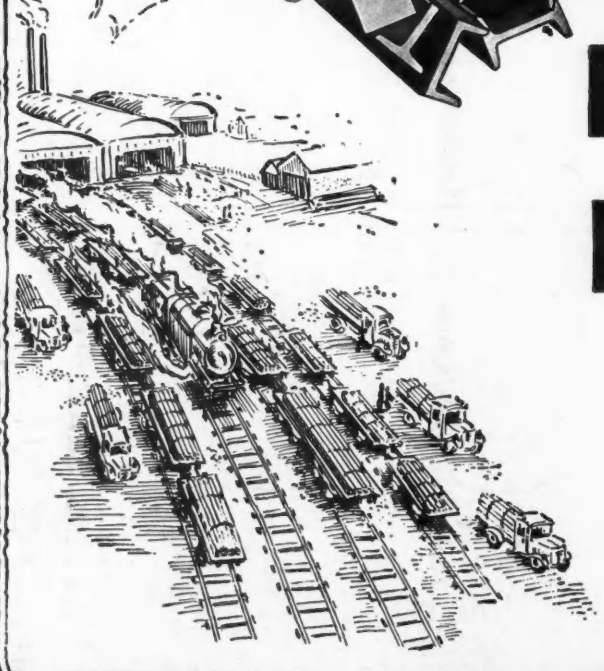

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